

**STATE OF UTAH
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
P.O. BOX 16690
SALT LAKE CITY, UTAH 84116-0690**

Ground Water Quality Discharge Permit

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended,

**Envirocare of Utah
46 West Broadway, Suite 116
Salt Lake City, Utah 84101**

hereafter referred to as the "Permittee", is granted a Ground Water Quality Discharge Permit for a Low-Level Radioactive Waste and 11e.(2) Waste Disposal Facility in accordance with conditions set forth herein. This facility currently consists of four separate operable units: a Low-Activity Radioactive Waste (LARW) Cell, an 11e.(2) Cell, a Mixed Waste Cell, and a Class A Cell which are located at approximately latitude 40° 41' 18" North, longitude 113° 06' 54" West.

This modified Ground Water Quality Discharge Permit amends and supercedes all other Ground Water Discharge permits for this facility issued previously.

This modified permit shall become effective on _____.

This permit and the authorization to operate shall expire at midnight, **March 1, 2005**

Executive Secretary
Water Quality Board

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APPENDIX C:	Specifications (approved 9/22/92 and 10/21/92) Operation, Maintenance, and Closure Plan for Collection Lysimeters and Related Approvals
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APPENDIX E:	Procedure For Certification of 11e.(2) Material, revised March 1994
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APPENDIX G:	Weather Station Monitoring Plan, dated September 14, 1994, revised July 12, 2002
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APPENDIX J:	Best Available Technology (BAT) Performance Monitoring Plan, approved September 14, 1999, latest revision May 15, 2002
APPENDIX K:	Best Available Technology (BAT) Contingency Plan, approved September 14, 1999, latest revision May 15, 2002

I. SPECIFIC CONDITIONS

A. Ground Water Classification

Based on ground water quality data submitted by the permit applicant, ground water in the vicinity of the site is defined as Class IV, saline ground water.

B. Background Ground Water Quality

1. Background Quality from Existing Monitoring Wells - Based on ground water quality samples collected through May 1998, the upper boundary of background ground water quality is defined as the mean concentration plus the second standard deviation for any contaminant in any individual well as determined by the Executive Secretary.

Based on prior waste disposal practices, the background ground water quality level for PCBs shall be below the Practical Quantitation Limit (PQL) identified in Appendix I.

2. Determination and Revision of Background Ground Water Quality - after submittal of additional ground water quality data, background ground water quality values may be revised by the Executive Secretary.

C. Ground Water Protection Levels

1. Ground Water Protection Levels, LARW Cell and Class A Cell - based on the types of wastes to be received for disposal in the low-activity radioactive waste (LARW) facility, which include naturally occurring radioactive materials (NORM) and Class A low-level radioactive waste (LLRW), an evaluation of indicator isotopes and their mobility, and the Ground Water Quality Standards (GWQS); ground water protection levels (GWPL) are defined as either the GWQS or the Background Concentration, whichever is greater, as listed in Tables 1A and 1B of this Permit. In all cases, ground water quality in any compliance monitoring well at the LARW Cell and Class A Cell shall comply with the GWPLs found in Table 1A, unless other GWPLs have been cited on a well and contaminant specific basis in Table 1B, below.
2. Ground Water Protection Levels, 11e.(2) Cell - based on the types of waste to be disposed of in the 11e.(2) Cells, an evaluation of the Ground Water Quality Standards; GWPLs for inorganic, dissolved metals, and organic parameters are defined as either the GWQS or the Background Concentration, whichever is greater, as listed in Tables 1C and 1D of this Permit. In all cases, ground water quality in any compliance monitoring well at the 11e.(2) Disposal Cells shall comply with the GWPLs found in Table 1C, unless other GWPLs have been cited on a well and contaminant specific basis in Table 1D, below.
3. Revision of Ground Water Protection Levels - after submittal of additional ground water quality data, the ground water protection levels may be revised by the Executive Secretary.

TABLE 1A: Ground Water Protection Levels (GWPL) - Universal to All LARW and Class A Wells

Parameter	GWPL ⁽¹⁾	Parameter	GWPL ⁽¹⁾
<i>Field and Inorganic Parameters (mg/l)</i>		<i>Radiologic Parameters - Alpha Emitters ⁽⁹⁾ (pCi/l)</i>	
Cyanide	0.2	Adjusted Gross Alpha ⁽¹⁰⁾	15
Fluoride	4.0	Neptunium-237 ⁽¹¹⁾	7
Total Nitrate/Nitrite (as N)	10.0	Strontium-90	42
pH (units)	6.5 - 8.5	Thorium-230	83
<i>Dissolved Metals (mg/l)</i>		Thorium-232	92
Arsenic	NA ⁽²⁾	Uranium-233	26
Barium	2.0	Uranium-234	26
Beryllium ⁽³⁾	0.004	Uranium-235	27
Cadmium	0.005	Uranium-236	27
Chromium	0.1	Uranium-238	26
Copper	1.3	<i>Radiologic Parameters - Beta/Gamma Emitters ⁽¹²⁾ (pCi/l)</i>	
Lead	0.015	Gross Beta	see Table 1B
Mercury	0.002	Carbon-14	3,200
Molybdenum	NA ⁽²⁾	Iodine-129 ⁽¹³⁾	21
Nickel ⁽³⁾	0.10	Technetium-99	3,790
Selenium	0.05	Tritium	60,900
Silver	0.1	<i>Combined Radiologic Parameters (pCi/l)</i>	
Uranium - total ⁽⁴⁾	0.03	Radium-226 + Radium-228 ⁽¹⁴⁾	5
Zinc	5.0		
<i>Organic Parameters (mg/l)</i>			
Acetone ⁽⁵⁾	0.7	1,2-Dichloroethane	0.005
2-Butanone ⁽⁵⁾	4.2	Methylene Chloride ⁽⁷⁾	0.005
Carbon Disulfide ⁽⁵⁾	0.7	1,1,2-Trichloroethane ⁽⁸⁾	0.005
Chloroform ⁽⁶⁾	0.08	Vinyl Chloride	0.002

TABLE 1B: Ground Water Protection Level Exceptions ⁽¹⁾ - LARW & Class A Wells

Well ID	Parameter	GWPL ⁽²⁾	Well ID	Parameter	GWPL ⁽²⁾
<i>Inorganic/Metal Parameters (mg/l)</i>					
GW-20	Fluoride	4.1	GW-95	Uranium - total	0.037
GW-29	Fluoride	4.5	GW-100	Uranium - total	0.138
GW-93	Uranium - total	0.031	P3-95 SWC	Uranium - total	0.180
GW-94	Uranium - total	0.032			
<i>Radiologic Parameters (pCi/l)</i>					
GW-16R	Gross Alpha ⁽³⁾	65	GW-85	Ra-226+Ra-228	9.14
	Gross Beta ⁽⁴⁾	980	GW-86	Gross Alpha ⁽³⁾	348
GW-20	Gross Alpha ⁽³⁾	197		Gross Beta ⁽⁴⁾	1,046
	Gross Beta ⁽⁴⁾	930		Ra-226+Ra-228	6.20
	Ra-226+Ra-228	5.41	GW-88	Gross Alpha ⁽³⁾	539
GW-22	Gross Alpha ⁽³⁾	280		Gross Beta ⁽⁴⁾	748
	Gross Beta ⁽⁴⁾	930		Ra-226+Ra-228	7.78
	Ra-226+Ra-228	5.28	GW-89	Gross Alpha ⁽³⁾	150
GW-23	Gross Alpha ⁽³⁾	186		Gross Beta ⁽⁴⁾	812
	Gross Beta ⁽⁴⁾	940		Ra-226+Ra-228	5.36
GW-24	Gross Alpha ⁽³⁾	406	GW-90	Gross Alpha ⁽³⁾	129
	Gross Beta ⁽⁴⁾	980		Gross Beta ⁽⁴⁾	1,086
	Ra-226+Ra-228	5.71		Ra-226+Ra-228	5.92
GW-29	Gross Alpha ⁽³⁾	190	GW-91	Gross Alpha ⁽³⁾	43
	Gross Beta ⁽⁴⁾	882		Gross Beta ⁽⁴⁾	1,108
	Ra-226+Ra-228	6.19		Ra-226+Ra-228	6.44
GW-56R	Gross Alpha ⁽³⁾	53	GW-92	Gross Alpha ⁽³⁾	209
	Gross Beta ⁽⁴⁾	770		Gross Beta ⁽⁴⁾	340
	Ra-226+Ra-228	5.51	GW-93	Gross Alpha ⁽³⁾	143
GW-64	Gross Alpha ⁽³⁾	79		Gross Beta ⁽⁴⁾	767
	Gross Beta ⁽⁴⁾	840		Ra-226+Ra-228	5.54
	Ra-226+Ra-228	5.63	GW-94	Gross Alpha ⁽³⁾	185
GW-77	Gross Alpha ⁽³⁾	67		Gross Beta ⁽⁴⁾	695
	Gross Beta ⁽⁴⁾	866	GW-95	Gross Alpha ⁽³⁾	185
	Ra-226+Ra-228	5.46		Gross Beta ⁽⁴⁾	779
I-2-30	Gross Alpha ⁽³⁾	114	GW-99	Gross Alpha ⁽³⁾	209
	Gross Beta ⁽⁴⁾	844		Gross Beta ⁽⁴⁾	607
GW-81	Gross Alpha ⁽³⁾	196		Ra-226+Ra-228	5.88
	Gross Beta ⁽⁴⁾	613	GW-100	Gross Alpha ⁽³⁾	348
GW-82	Gross Alpha ⁽³⁾	466		Gross Beta ⁽⁴⁾	963
	Gross Beta ⁽⁴⁾	653		Uranium-234	71
GW-83	Gross Alpha ⁽³⁾	198		Uranium-238	43
	Gross Beta ⁽⁴⁾	431	GW-101	Gross Alpha ⁽³⁾	210
GW-84	Gross Alpha ⁽³⁾	187		Gross Beta ⁽⁴⁾	550
	Gross Beta ⁽⁴⁾	705	GW-102	Gross Alpha ⁽³⁾	185
	Ra-226+Ra-228	7.12		Gross Beta ⁽⁴⁾	736
GW-85	Gross Alpha ⁽³⁾	218	GW-103	Gross Alpha ⁽³⁾	42
	Gross Beta ⁽⁴⁾	666		Gross Beta ⁽⁴⁾	532

TABLE 1B Continued: Ground Water Protection Level Exceptions ⁽¹⁾ - LARW & Class A Wells

Well ID	Parameter	GWPL ⁽²⁾	Well ID	Parameter	GWPL ⁽²⁾
<i>Radiologic Parameters Continued (pCi/l)</i>					
GW-104	Gross Alpha ⁽³⁾	133	P3-95 SWC	Gross Alpha ⁽³⁾	87
	Gross Beta ⁽⁴⁾	883		Gross Beta ⁽⁴⁾	730
GW-105	Gross Alpha ⁽³⁾	85		Uranium-234	48
	Gross Beta ⁽⁴⁾	732		Uranium-238	79
	Ra-226+Ra-228	5.18		Ra-226+Ra-228	7.63
P3-95 NEC	Gross Alpha ⁽³⁾	117	P3-97 NEC	Gross Alpha ⁽³⁾	111
	Gross Beta ⁽⁴⁾	374		Gross Beta ⁽⁴⁾	606

TABLE 1C: Ground Water Protection Levels - Universal for all 11e.(2) Wells

Parameter	GWPL ⁽¹⁾	Parameter	GWPL ⁽¹⁾
<i>Field and Inorganic Parameters ⁽²⁾ (mg/l)</i>		<i>Organic Parameters - Specific to 11e.(2) (mg/l)</i>	
Cyanide	0.2	Acetone ⁽⁵⁾	0.7
Fluoride	4.0	2-Butanone ⁽⁵⁾	4.2
Total Nitrate/Nitrite (as N)	10.0	Carbon Disulfide ⁽⁵⁾	0.7
pH (units)	6.5 - 8.5	Chloroform ⁽⁶⁾	0.08
<i>Dissolved Metals ⁽²⁾ (mg/l)</i>		1,2-Dichloroethane	0.005
Arsenic	NA ⁽³⁾	Methylene Chloride ⁽⁷⁾	0.005
Barium	2.0	Naphthalene ⁽⁸⁾	0.02
Beryllium ⁽⁴⁾	0.004	Diethyl Phthalate ⁽⁹⁾	5.0
Cadmium	0.005	2-Methylnaphthalene ⁽¹⁰⁾	0.004
Chromium	0.1		
Copper	1.3		
Lead	0.015		
Mercury	0.002		
Molybdenum	NA ⁽³⁾		
Nickel ⁽⁴⁾	0.10		
Selenium	0.05		
Silver	0.1		
Uranium - total	0.03		
Zinc	5.0		

TABLE 1D: Ground Water Protection Level Exceptions ⁽¹⁾ - 11e.(2) Wells

Well ID	Parameter	GWPL ⁽²⁾	Well ID	Parameter	GWPL ⁽²⁾
<i>Inorganic/Metal Parameters (mg/l)</i>					
GW-19A	Fluoride	5.8	GW-27	Fluoride	4.5
GW-20	Fluoride	4.1		Uranium - total	0.040
GW-25	Fluoride	4.4	GW-28	Fluoride	4.2
	Uranium - total	0.141	GW-29	Fluoride	4.5
GW-26	Fluoride	4.8	GW-36	Uranium - total	0.057
	Uranium - total	0.033	GW-58	Uranium - total	0.039

TABLE 1E: Ground Water Protection Levels Universal to All Mixed Waste Wells

Parameter	GWPL	Parameter	GWPL
<i>Dissolved Metals (mg/l)</i>			
Uranium - total ⁽¹⁾	0.03		
<i>Radiologic Parameters (pCi/l)</i>			
<i>Alpha Emitters</i> ⁽²⁾		<i>Beta/Gamma Emitters</i> ⁽⁵⁾	
Adjusted Gross Alpha ⁽³⁾	15	Gross Beta	to be defined ⁽⁶⁾
Neptunium-237 ⁽⁴⁾	7	Carbon-14	3,200
Strontium-90	42	Iodine-129 ⁽⁷⁾	21
Thorium-230	83	Technetium-99	3,790
Thorium-232	92	Tritium	60,900
Uranium-233	26		
Uranium-234	26	<i>Combined Radiologic Parameters (pCi/l)</i>	
Uranium-235	27	Radium-226 + Radium-228 ⁽⁸⁾	5
Uranium-236	27		
Uranium-238	26		

TABLE 1F: Ground Water Protection Level Exceptions ⁽¹⁾ - Mixed Waste Wells

Well ID	Parameter	GWPL ⁽²⁾	Well ID	Parameter	GWPL ⁽²⁾
<i>Radiologic Parameters (pCi/l)</i>					
GW-41	Gross alpha ⁽³⁾	288	<u>GW-118</u>	<u>Gross alpha ⁽³⁾</u>	<u>55</u>
	Gross beta ⁽⁴⁾	770		<u>Gross beta ⁽⁴⁾</u>	<u>686</u>
	Ra-226+Ra-228	8.07	<u>GW-119</u>	<u>Gross alpha ⁽³⁾</u>	<u>60</u>
GW-42	Gross alpha ⁽³⁾	128		<u>Gross beta ⁽⁴⁾</u>	<u>596</u>
	Gross beta ⁽⁴⁾	580		<u>Ra-226+Ra-228</u>	<u>5.03</u>
	Ra-226+Ra-228	6.88	<u>GW-120</u>	<u>Gross alpha ⁽³⁾</u>	<u>64</u>
GW-66	Gross alpha ⁽³⁾	129		<u>Gross beta ⁽⁴⁾</u>	<u>539</u>
	Gross beta ⁽⁴⁾	597		<u>Ra-226+Ra-228</u>	<u>5.1</u>
GW-67	Gross alpha ⁽³⁾	83	<u>GW-121</u>	<u>Gross alpha ⁽³⁾</u>	<u>56</u>
	Gross beta ⁽⁴⁾	529		<u>Gross beta ⁽⁴⁾</u>	<u>582</u>
GW-68	Gross alpha ⁽³⁾	287		<u>Ra-226+Ra-228</u>	<u>5.42</u>
	Gross beta ⁽⁴⁾	873	<u>GW-122</u>	<u>Gross alpha ⁽³⁾</u>	<u>52</u>
GW-69	Gross alpha ⁽³⁾	94		<u>Gross beta ⁽⁴⁾</u>	<u>495</u>
	Gross beta ⁽⁴⁾	1,288	<u>GW-123R</u>	<u>Gross alpha ⁽³⁾</u>	<u>47</u>
	Ra-226+Ra-228	7.17		<u>Gross beta ⁽⁴⁾</u>	<u>669</u>
GW-70	Gross alpha ⁽³⁾	141		<u>Ra-226+Ra-228</u>	<u>5.91</u>
	Gross beta ⁽⁴⁾	917	<u>GW-124</u>	<u>Gross alpha ⁽³⁾</u>	<u>57</u>
GW-71	Gross alpha ⁽³⁾	36		<u>Gross beta ⁽⁴⁾</u>	<u>809</u>
	Gross beta ⁽⁴⁾	483	I-1-30	Gross alpha ⁽³⁾	158
GW-79	Gross alpha ⁽³⁾	140		Gross beta ⁽⁴⁾	560
	Gross beta ⁽⁴⁾	549			
GW-80	Gross alpha ⁽³⁾	130			
	Gross beta ⁽⁴⁾	568			

TABLE 1 FOOTNOTES

Table 1A Footnotes:

1. All ground water protection levels (GWPLs) derived from Ground Water Quality Standards (GWQS, see UAC R317-6-2), except as noted.
2. Due to naturally elevated concentrations of arsenic and molybdenum in the Class IV saline aquifer at Clive, Utah, these constituents are poor indicators of cell leakage and therefore will not be used as compliance parameters with ground water protection levels. However, the Permittee will continue to sample, analyze, and report arsenic and molybdenum data in all compliance monitoring wells at Permit and Licence renewal as a best management practice.
3. Beryllium and Nickel GWQS derived from EPA drinking water Maximum Contaminant Levels (MCL), as published in the July 17, 1992 Federal Register, Vol. 57, No. 138, pp. 31776 - 31849, Table 1.
4. Total uranium GWQS of 0.03 mg/l from EPA final MCL in National Primary Drinking Water Regulations Final Rule for Radionuclides (December 7, 2000 Federal Register, Vol. 65, No. 236, p. 76708).
5. GWQS for acetone, 2-Butanone, and carbon disulfide determined by DWQ staff from reference doses available in the technical literature, see August 8, 1994 DWQ Staff Report: Ground Water Quality Conditions and Proposed Revision to Ground Water Protection Levels, Envirocare of Utah Inc., Low-Level Radioactive Waste and 11e.(2) Waste Disposal Facility, near Clive, Tooele County, Utah, p. 3.
6. GWQS for chloroform derived from a 1998 EPA final drinking water MCL for total trihalomethane compounds in "Drinking Water Standards and Health Advisories", EPA 822-B-00-001, Summer 2000.
7. GWQS for methylene chloride derived from EPA drinking water MCL (ibid.).
8. GWQS for 1,1, 2-Trichloroethane from final EPA MCL in "Drinking Water Regulations and Health Advisories", EPA 822-B-96-002, October 1996.
9. All GWPL values for alpha-emitting radionuclides based on 1E-4 lifetime cancer mortality risk concentration levels provided in 1991 EPA draft MCL values for drinking water (July 18, 1991 Federal Register, Vol. 56, No. 138, pp. 33078-9, 33100-3, and Appendix C).
10. Adjusted Gross alpha activity excludes radon, radium-226, and uranium alpha particle activity. Gross alpha activity to be determined by co-precipitation, EPA Method 00-02.
11. Neptunium-237, as determined by Total Radioactive Neptunium, EPA Method 907.0.
12. All GWPL values for beta/gamma emitting radionuclide parameters based on a 4 millirem/year equivalent dosage, as per 1991 EPA draft MCL values for drinking water (July 18, 1991 Federal Register, Vol. 56, No. 138, pp. 33078, 33103, and Appendix B).
13. Iodine-129, as determined by Total Radioactive Iodine, EPA Method 902.0.
14. GWQS of 5 pCi/l for combined radium-226 + radium-228 from final EPA MCL in National Primary Drinking Water Regulations Final Rule for Radionuclides (December 7, 2000 Federal Register, Vol. 65, No. 236, p. 76708).

Table 1B Footnotes:

1. Table 1B exceptions constitute specific wells and parameters determined to have natural background ground water quality concentrations above GWQS, or as otherwise specified below. Background concentration is defined as the mean concentration plus the second standard deviation for any contaminant in any individual well.
2. The number of significant figures used for all GWPLs determined by laboratory results previously reported by Envirocare.
3. Adjusted Gross alpha activity excludes radon, radium-226, and uranium alpha particle activity. Gross alpha activity to be determined by co-precipitation, EPA Method 00-02.
4. No specific regulatory criteria provided for gross beta activity for Class IV ground water. However, gross beta measurements to be used as an indicator for many other beta-emitting radioisotopes. GWPL defined as the background concentration.
5. Iodine-129, as determined by Total Radioactive Iodine, EPA Method 902.0.

Table 1C Footnotes:

1. All field, inorganic, dissolved metals, and organic indicator organic parameters and corresponding GWPLs for the 11e.(2) wells are equivalent to those for the LARW wells in Table 1A, above.
2. All ground water protection levels (GWPL) derived from Ground Water Quality Standards (GWQS, see UAC R317-6-2), except as noted.
3. Due to naturally elevated concentrations of arsenic and molybdenum in the Class IV saline aquifer at Clive, Utah, these constituents are poor indicators of cell leakage and therefore will not be used as compliance parameters with ground water protection levels. However, the Permittee will continue to sample, analyze, and report arsenic and molybdenum data in all compliance monitoring wells at Permit and Licence renewal as a best management practice.
4. Beryllium and Nickel GWQS derived from EPA drinking water Maximum Contaminant Levels (MCL), as published in the July 17, 1992 Federal Register, Vol. 57, No. 138, pp. 31776 - 31849, Table 1.
5. GWQS for acetone, 2-Butanone, and carbon disulfide determined by DWQ staff from reference doses available in the technical literature, see August 8, 1994 DWQ Staff Report: Ground Water Quality Conditions and Proposed Revision to Ground Water Protection Levels, Envirocare of Utah Inc., Low-Level Radioactive Waste and 11e.(2) Waste Disposal Facility, near Clive, Tooele County, Utah, p. 3.
6. GWQS for chloroform derived from a 1998 EPA final drinking water MCL for total trihalomethane compounds in "Drinking Water Standards and Health Advisories", EPA 822-B-00-001, Summer 2000.
7. GWQS for methylene chloride derived from EPA drinking water MCL (ibid.).
8. Naphthalene GWQS derived from final EPA drinking water LHA (ibid.).
9. GWQS for diethyl phthalate based on draft EPA drinking water LHA (ibid.).
10. GWQS for 2-methylnaphthalene could not be located or determined, thanks to a lack of reference dosage information in the technical literature. Consequently, a detection monitoring approach has been taken and the

GWPL set equal to the minimum achievable detection limit for the compound as a result of matrix interferences from high TDS content of Clive ground water. As health-based risk or other reference dosage information becomes available, the Executive Secretary may modify the Permit and set a GWQS for 2-methylnaphthalene.

Table 1D Footnotes:

1. Table 1D exceptions constitute specific wells and parameters determined to have natural background ground water quality concentrations above GWQS, or as otherwise specified below. Background concentration is defined as the mean concentration plus the second standard deviation for any contaminant in any individual well.
2. The number of significant figures used for all GWPLs determined by laboratory results previously reported by Envirocare.

Table 1E Footnotes:

1. Total uranium GWQS of 0.03 mg/l from EPA final MCL in National Primary Drinking Water Regulations Final Rule for Radionuclides (December 7, 2000 Federal Register, Vol. 65, No. 236, p. 76708).
2. All GWPL values for alpha-emitting radionuclides based on 1E-4 lifetime cancer mortality risk concentration levels provided in 1991 EPA draft MCL values for drinking water (July 18, 1991 Federal Register, Vol. 56, No. 138, pp. 33078-9, 33100-3, and Appendix C).
3. Adjusted Gross alpha activity excludes radon, radium-226, and uranium alpha particle activity. Gross alpha activity to be determined by co-precipitation, EPA Method 00-02.
4. Neptunium-237, as determined by Total Radioactive Neptunium, EPA Method 907.0.
5. All GWPL values for beta/gamma emitting radionuclide parameters based on a 4 millirem/year equivalent dosage, as per 1991 EPA draft MCL values for drinking water (July 18, 1991 Federal Register, Vol. 56, No. 138, pp. 33078, 33103, and Appendix B).
6. Gross Beta groundwater quality data for calculating background statistics are not currently available to the Executive Secretary for most Mixed Waste Wells. Consequently, Permit may be reopened and modified later as data becomes available.
7. Iodine-129, as determined by Total Radioactive Iodine, EPA Method 902.0.
8. GWQS of 5 pCi/l for combined radium-226 + radium-228 from final EPA MCL in National Primary Drinking Water Regulations Final Rule for Radionuclides (December 7, 2000 Federal Register, Vol. 65, No. 236, p. 76708).

Table 1F Footnotes:

1. Table 1F exceptions constitute specific wells and parameters determined to have natural background ground water quality concentrations above GWQS, or as otherwise specified below. Background concentration is defined as the mean concentration plus the second standard deviation for any contaminant in any individual well.
2. The number of significant figures used for all GWPLs determined by laboratory results previously reported by Envirocare.

3. Adjusted Gross alpha activity excludes radon, radium-226, and uranium alpha particle activity. Gross alpha activity to be determined by co-precipitation, EPA Method 00-02.
4. No specific regulatory criteria provided for gross beta activity for Class IV ground water. However, gross beta measurements to be used as an indicator for many other beta-emitting radioisotopes. GWPL defined as the background concentration.

D. Best Available Technology (BAT) Design Standard

1. Discharge Technology Performance Criteria - best available technology for the facility will incorporate discharge technology based on the use of earthen materials in both the bottom liner and final cover. However, under no circumstances shall the facility cause ground water at the compliance monitoring wells (Part I.F.1) to exceed the ground water protection levels in Part I.C for the following minimum periods of time:

<u>Disposal Cell</u>	<u>Contaminant Group</u>	<u>Performance Standard*</u>
LARW and Class A	Heavy metals	200 years
	Inorganics	200 years
	Organics	200 years
	Mobile and non-mobile	
	Radionuclides	500 years
11e.(2)	Heavy metals	200 years
	Inorganics	200 years
	Organics	200 years
Mixed Waste	Mobile and non-mobile	
	Radionuclides	500 years

- * Said performance standards shall be measured from the following initial startup dates: 1988 [LARW Cell], 1992 [Mixed Waste Cell], 1994 [11e.(2) Cells], and 2000 [Class A Cell].

After review of any environmental monitoring data collected at the facility, the Executive Secretary determines that the ground water protection levels in Part I.C of the Permit may be exceeded at the compliance monitoring wells before completion of the above minimum time periods, said potential shall constitute a violation of the Best Available Technology requirements of this Permit.

2. Final Authorized LARW Cell Engineering Design and Specifications - the best available technology design standard shall be defined by, and construction of the LARW facilities shall conform to the engineering plans summarized in Table 2A, below, and the specifications listed in the approved LARW Construction Quality Assurance/Quality Control (CQA/QC) Plan (Radioactive Materials License, Condition 44):

For the LARW Cell, this engineering design includes, but is not limited to, the following elements:

- a) Cover System - shall include the following materials or as specified by the approved LARW CQA/QC Plan (Radioactive Materials License, Condition 44), from the top down:
 - 1) an 18-inch thick erosion barrier consisting of a 1.25-inch, or greater, average diameter rock material over the top-slope area, and a 4.5-inch, or greater average diameter rock material over the side-slope area, as specified on the approved Envirocare engineering drawing number 9407-4, Revision S2, dated and submitted on October 15, 1999.
 - 2) a 6-inch thick upper filter zone consisting of sandy gravel material,
 - 3) a 12-inch compacted thickness of sacrificial soil with a minimum Residual Moisture Content of 3.5 % (by weight). Such Residual Moisture Content shall be the asymptotic value measured by ASTM Methods D-3152 and D-2325 at soil tensions above 15 bars,
 - 4) a 6-inch lower filter zone consisting of sandy gravel material with a minimum permeability of 3.5 cm/sec,

~~* Placement of these three layers shall be limited to the top slope area. No sacrificial soil will be constructed over the side slopes of the LARW Cell and the two filter layers shall merge into a single 12-inch thick filter layer. Material gradation of the upper and lower filters shall comply with the following requirements:~~

Particle Size Distribution	Particle Size		
	Upper (Type A) Filter	Sacrificial Soil	Lower (Type B) Filter
D ₁₀₀	≤ 6.0 inch	≤ 0.75 inch	≤ 1.5 inch
D ₇₀	≤ 3.0 inch	n/a	n/a
D ₆₀	n/a	≥ 0.375 inch	n/a
D ₅₀	≤ 1.57 inch (40 mm)	n/a	n/a
D ₄₀	n/a	n/a	≥ 0.375 inch
D ₃₅	n/a	≥ No. 4 sieve (4.75 mm)	n/a
D ₁₅	≤ 0.85 inch (22 mm)	≥ No. 200 sieve (0.074 mm)	n/a
D ₁₀	≥ No. 10 sieve (2.0 mm)	n/a	≥ No. 4 sieve
D ₅	≥ No. 200 sieve (0.074 mm)	n/a	n/a

- 5) a ~~7-foot~~ 2-foot thick clay radon barrier measured vertically. Said radon barrier will be divided into two layers:
 - i) an upper layer, one-foot thick, with a field hydraulic conductivity of 5.0E-8 cm/sec or less, and

- ii) a lower layer, ~~six feet~~ one foot thick with a field hydraulic conductivity of $1.0E-6$ cm/sec or less.

Top slope of the embankment shall be between 2% and 4%, as specified on the approved engineering drawings, and side slopes shall be no steeper than approximately 5:1. The outside toe of the clay radon barrier/liner shall extend outward and beyond the outermost edge of the waste layer and shall merge with the bottom clay liner.

- b) Waste Layer - the waste layer shall not exceed a final thickness of 43 feet above the top of the bottom clay liner.
- c) Clay Bottom Liner - the bottom clay liner shall be constructed below natural grade on slopes no greater than 0.12% north to south and 0.2% east to west. Final grade and elevation for the base of the clay liner will comply with the approved engineering design (Table 2A). This liner will be constructed after excavation of the site to the total design depth, followed by placement of imported clay materials, which meet the approved specifications for material and construction. The new clay liner shall be graded to prevent the accumulation of leachate over the existing one-foot thick clay liner. The clay liner shall be a minimum of 2 feet thick, measured perpendicular to the slope, constructed in accordance with the approved LARW CQA/QC Plan (Radioactive Materials License, Condition 44), and have a field hydraulic conductivity of $1.0E-6$ cm/sec or less.

TABLE 2A: Approved LARW Cell Engineering Design Drawings

Envirocare Drawing	Last Revision Date	Subject
9407-2, Rev. E	July 28, 1998	LARW Disposal Cell - Cell Location & Excavation Limits
9407-4, Rev. S2 <u>T</u>	October 15, 1999 <u>May 16, 2003</u>	LARW Disposal Cell - LARW Cell Closure
9407-4A, Rev. K <u>L</u>	July 9, 1999 <u>May 16, 2003</u>	LARW Disposal Cell - LARW Cell Closure
9407-4B, Rev. I <u>J</u>	October 15, 1998 <u>May 16, 2003</u>	LARW Disposal Cell - LARW Cell Closure
9407-5, Rev. I	February 4, 1999	LARW Disposal Cell - Site Layout
9407-6, Rev. E	July 28, 1998	LARW Disposal Cell - Site Layout
9407-7, Rev. A	June 27, 1994	Drainage Plan - Plan View
9407-7A, Rev. A	June 27, 1994	Drainage Plan - Details
9407-8, Rev. C	October 16, 1998	LARW Disposal Cell Wedge Expansion Cross Section
<u>03046-VO1, Rev. 0</u>	<u>May 16, 2003</u>	<u>LARW Disposal Cell – Radon Barrier Design Section Details</u>
<u>03046-VO1, Rev. 0</u>	<u>May 16, 2003</u>	<u>LARW Disposal Cell – Radon Barrier Design Sections and Details</u>
<u>03046A-VO1 Rev. -</u>	<u>August 1, 2003</u>	<u>LARW Disposal Cell Closure - Plan and Details</u>
<u>03046A-VO2 Rev. -</u>	<u>August 1, 2003</u>	<u>LARW Disposal Cell Closure – Sections & Details</u>
<u>03046A-VO3 Rev. -</u>	<u>August 1, 2003</u>	<u>LARW Disposal Cell – Radon Barrier Redesign Sections & Details</u>
<u>03046A-VO4 Rev. -</u>	<u>August 1, 2003</u>	<u>LARW Disposal Cell – Radon Barrier Redesign Sections & Details</u>

<u>03046A-VO5 Rev. -</u>	<u>August 1, 2003</u>	<u>LARW Disposal Cell – Radon Barrier Redesign Section & Details</u>
L9	July 21, 1993	Fence Details
Page 1	March 10, 1994	LARW Bulk Storage Pad Repair: Plan View, As-Built
Page 2	March 10, 1994	LARW Bulk Storage Pad Repair: Details - As-Built
9412-1, Rev. A	December 5, 1994	LARW Bulk Storage Pad French Drain Addition Plan View and Sections, As-Built
9514-1, Rev. B	December 19, 1998	LARW Disposal Facility Container Storage Pad: Plan, Sections, and Details; As-Built

3. 11e.(2) Disposal Cell Design - the best available technology design standard shall be defined by, and construction of the 11e.(2) Cells shall conform to the approved engineering design summarized in Table 2B, below, and the specifications listed in the revised Construction QA/QC Plan for 11e.(2) Facility dated February 8, 2002 in Appendix D of this Permit.

TABLE 2B: Approved 11e.(2) Cell Engineering Design Drawings

Drawing	Last Revision Date	Subject
9420-4, Rev. F	March 4, 2002	11e.(2) Disposal Cell, Layout
9420-5, Rev. D	February 21, 2002	11e.(2) Disposal Cell, Cross Sections
9420-6, Rev. D	December 21, 2002	11e.(2) Disposal Cell, Ditch Cross Sections

Said 11e.(2) Cell engineering design shall include, but is not limited to, the following elements:

- a) Cover System - shall include the following materials, as described from the top down:
 - 1) Top-slope Area - the top-slope shall consist of the following materials, from the top down:
 - i) Riprap Erosion Barrier - a 12-inch thick layer of rock armor material with a particle size ranging from 0.75 to 4.50 inches in diameter with an average diameter between 1.125 and 3.0 inches.
 - ii) Filter Zone - a single 12-inch thick layer of granular material with a particle size ranging from 0.3125 to 3.0 inches in diameter (coarse sand to fine cobble) and a minimum hydraulic conductivity of 42 cm/sec.
 - iii) Upper Radon Barrier – a layer of clay material at least 12 inches thick with a field hydraulic conductivity of 5.0E-8 cm/sec or less.
 - iv) Lower Radon Barrier - a layer of clay material at least 3 feet thick with a field hydraulic conductivity of 1.0E-6 cm/sec or less.

The minimum slope for top-slope areas shall be 2.1%.

- 2) Side-slope Area - the side-slope area shall consist of the following materials, from the top down:
- i) Riprap Erosion Barrier - an 18-inch thick layer of rock armor material with a particle size ranging from 2.0 to 16.0 inches in diameter with an average diameter between 4.5 and 8.0 inches.
 - ii) Filter Zone - a single 12-inch thick layer of granular material with a particle size ranging from 0.3125 to 3.0 inches in diameter (coarse sand to fine cobble) and a minimum hydraulic conductivity of 42 cm/sec.
 - iii) Upper Radon Barrier – a layer of clay material at least 12 inches thick with a field hydraulic conductivity of 5.0E-8 cm/sec or less.
 - iv) Lower Radon Barrier - a layer of clay material at least 2.5 feet thick with a field hydraulic conductivity of 1.0E-6 cm/sec or less.

The minimum slope for side-slope areas shall be 20%.

- b) 11e.(2) Waste Layer - the 11e.(2) waste shall not exceed a final thickness of 47 feet above the bottom clay liner.
 - c) Bottom Clay Liner - the clay liner will be constructed only after excavation of the site to the total design depth, followed by placement of imported clay materials which meet the approved specifications for material and construction. The clay liner shall be a minimum of 2 feet thick, measured perpendicular to the slope, and have a field hydraulic conductivity of 1.0E-6 cm/sec or less.
4. Final Authorized Class A Cell Engineering Design and Specifications - the best available technology design standard shall be defined by, and construction of the Class A facilities shall conform to the engineering plans summarized in Table 2C, below, and the specifications listed in the approved LLRW Construction Quality Assurance/Quality Control (CQA/QC) Plan (Radioactive Materials License, Condition 44):

For the Class A cell, this engineering design includes, but is not limited to, the following elements:

- a) Cover System - top-slope and side-slope areas shall include the following materials or as specified by the approved LLRW CQA/QC Plan (Radioactive Materials License, Condition 44), from the top down:
 - 1) an 18-inch thick erosion barrier consisting of a 1.25-inch, or greater, average diameter rock material over the top-slope area, and a 4.5-inch, or greater average diameter rock material over the side-slope area, as specified on the approved Envirocare engineering drawing number 9821-01.
 - 2) a 6-inch thick upper filter zone consisting of sandy gravel material,

- 3) a 12-inch compacted thickness of sacrificial soil with a minimum Residual Moisture Content of 3.5 % (by weight). Such Residual Moisture Content shall be the asymptotic value measured by ASTM Methods D-3152 and D-2325 at soil tensions above 15 bars,
- 4) a 6-inch lower filter zone consisting of sandy gravel material with a minimum permeability of 3.5 cm/sec,

Material gradation of the sacrificial soil layer and upper and lower filters shall comply with the following requirements:

Particle Size Distribution	Particle Size		
	Upper (Type A) Filter	Sacrificial Soil	Lower (Type B) Filter
D ₁₀₀	≤ 6.0 inch	≤ 0.75 inch	≤ 1.5 inch
D ₇₀	≤ 3.0 inch	n/a	n/a
D ₆₀	n/a	≥ 0.375 inch	n/a
D ₅₀	≤ 1.57 inch (40 mm)	n/a	n/a
D ₄₀	n/a	n/a	≥ 0.375 inch
D ₃₅	n/a	≥ No. 4 sieve (4.75 mm)	n/a
D ₁₅	≤ 0.85 inch (22 mm)	≥ No. 200 sieve (0.074 mm)	n/a
D ₁₀	≥ No. 10 sieve (2.0 mm)	n/a	≥ No. 4 sieve
D ₅	≥ No. 200 sieve (0.074 mm)	n/a	n/a

- 5) a 2-foot thick clay radon barrier measured vertically. Said radon barrier will be divided into two layers:
 - i) an upper layer, one foot thick, with a field hydraulic conductivity of 5.0E-8 cm/sec or less, and
 - ii) a lower layer, one foot thick with a field hydraulic conductivity of 1.0E-6 cm/sec or less.

Top slope of the embankment shall be between 2% and 4%, as specified on the approved engineering drawings, and side slopes shall be no steeper than approximately 5:1. The outside toe of the clay radon barrier/liner shall extend outward and beyond the outermost edge of the waste layer and shall merge with the bottom clay liner.

- b) Waste Layer - the waste layer shall not exceed a final thickness of 54 feet above the top of the bottom clay liner.
- c) Clay Bottom Liner - the bottom clay liner shall be constructed below natural grade on slopes no greater than 0.12% north to south and 0.2% east to west. Final grade and elevation for the base of the clay liner will comply with the approved engineering design (Table 2C). This liner will be constructed after excavation of

the site to the total design depth, followed by placement of imported clay materials, which meet the approved specifications for material and construction. The new clay liner shall be graded to prevent the accumulation of leachate over the existing one-foot thick clay liner. The clay liner shall be a minimum of 2 feet thick, measured perpendicular to the slope, constructed in accordance with the approved LLRW CQA/QC Plan (Radioactive Materials License, Condition 44), and have a field hydraulic conductivity of $1.0\text{E-}6$ cm/sec or less.

TABLE 2C: Approved Class A Cell Engineering Design Drawings

Envirocare Drawing	Last Revision	Subject
9821-01, Rev. G	March 28, 2003	Class A Disposal Cell – Layout Plan & Cover Details
9821-02, Rev. C	March 22, 2002	Class A Disposal Cell - Cross Sections
9821-03, Rev. B	March 22, 2002	Class A Disposal Cell – Ditch Details
9821-04, Rev. A	July 25, 2000	Class A Disposal Cell - Updated Drainage System

5. Disposal Cell Location Restrictions - the LARW, 11e.(2), and Class A disposal cells shall be restricted to the following locations in Section 32, Township 1 South, Range 11 West, SLBM, as specified on the currently approved engineering plans, Envirocare drawings, and the approximate Latitude and Longitude Coordinates from the April 24, 2000 Pentacore survey provided in Table 3 below:

TABLE 3. Authorized LARW, 11e.(2), and Class A Disposal Cell Locations

Disposal Cell	Edge of Waste Position	Latitude and Longitude Coordinates	
		Latitude	Longitude
LARW	NW Corner	40° 41' 10.851418" N	113° 6' 50.846182" W
	SW Corner	40° 40' 52.379041" N	113° 6' 51.184491" W
	SE Corner	40° 40' 52.230624" N	113° 6' 36.713462" W
	NE Corner	40° 41' 10.700524" N	113° 6' 36.372920" W
11e.(2)	NW Corner	40° 41' 12.531691" N	113° 7' 24.037415" W
	SW Corner	40° 40' 55.004159" N	113° 7' 24.684273" W
	SE Corner	40° 40' 54.379460" N	113° 6' 55.514932" W
	NE Corner	40° 41' 11.913013" N	113° 6' 54.859752" W
Class A	NW Corner	40° 41' 28.004487" N	113° 7' 23.847971" W
	SW Corner	40° 41' 14.175042" N	113° 7' 24.153414" W
	SE Corner	40° 41' 13.717662" N	113° 6' 54.827468" W
	NE Corner	40° 41' 27.547403" N	113° 6' 54.521700" W

This description does not include the Mixed Waste facility, located east of the LARW Cell, which is authorized under a separate RCRA permit from the Utah Division of Solid and Hazardous Waste.

6. Definition of LARW Waste - for purposes of this Permit, Low-Activity Radioactive Waste (LARW) is defined as radioactive wastes, which meet the definition of Class A Low-Level Radioactive Waste (LLRW) under the Utah Radiation Control Rules, UAC R313-15-1008, or are defined as Naturally Occurring and Accelerator Produced Radioactive Materials under the Utah Radiation Control Rules, UAC R313-12-3.
7. Definition of Mobile Waste - any waste containing any of the following isotopes shall be considered a mobile waste and subject to special provisions or requirements under this Permit: aluminum-26, berkelium-247, calcium-41, californium-249, californium-250, carbon-14, chlorine-36, iodine-129, neptunium-237, rhenium-187, sodium-22, technetium-99, terbium-157, terbium-158, or tritium.
8. Definition of PCB/Radioactive Waste- for purposes of this Permit, PCB/Radioactive Waste to be accepted for disposal shall meet the criteria specified in R315-315-7(2)(a)

or (3)(b)(i-vi) of the rules designated for disposal in a municipal or non-municipal non-hazardous landfill.

9. Definition of 11e.(2) Waste - for purposes of this Permit, 11e.(2) Waste is defined as "... tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content", as defined in Section 11e.(2) of the U.S. Atomic Energy Act of 1954, as amended.
- ~~10. Disposal Location Restriction for Mobile Waste in the LARW Disposal Cell - the disposal of mobile waste in the LARW Cell shall be restricted to the following location in Section 32, Township 1 South, Range 11 West, SLBM, as specified on the currently approved engineering plans, Envirocare drawings, and as described by the approximate Latitude and Longitude Coordinates from the April 24, 2000 Pentacore survey provided in Table 4:~~

~~TABLE 4. Authorized Mobile Waste Disposal Locations: LARW Disposal Cell~~

Mobile Area Description LARW Cell	Edge of Waste Position	Latitude and Longitude Coordinates	
		Latitude	Longitude
	Northeast Corner	40° 41' 10.206265" N	113° 6' 37.022208" W
	Southeast Corner	40° 40' 52.823735" N	113° 6' 37.391607" W
	Southwest Corner	40° 40' 52.972152" N	113° 6' 50.405346" W
	Northwest Corner	40° 41' 10.357159" N	113° 6' 50.196894" W

~~Any disposal of mobile waste in any other location within the LARW Disposal Cell shall constitute a violation of this Permit.~~

11. Collection Lysimeters for Future Construction at the LARW Cell and Class A Cell - future construction of the clay bottom liner of the LARW Cell and the Class A Cell shall include the installation of collection lysimeters below the bottom clay liner, in accordance with the engineering plans and specifications approved by the Executive Secretary on September 22, 1992 and included herein as Appendix C. The Permittee shall also comply with the October 21, 1992 Operation, Maintenance and Closure Plan for Envirocare's Collection Lysimeters and the DWQ November 27, 1992 Conditional Approval thereof, also included herein as Appendix C. In addition, the Permittee shall comply with the following requirements:
- Collection Lysimeter "As-Built" Report - within 30 days of completion of the construction of each lysimeter, the Permittee shall submit an "As-Built" Report for Executive Secretary approval.
 - Future Collection Lysimeter Construction Notification - the Permittee shall submit a notice of construction of additional lysimeters in the LARW Cell or Class A Cell. Said notice shall be submitted at least one week prior to construction in order to allow the Executive Secretary to inspect lysimeter construction.
 - Future Collection Lysimeter Construction - in addition to any design or construction requirements found in Appendix C, the Permittee shall construct all future collection lysimeters in a manner that will allow the lysimeter to be operated in compliance with all performance standards mandated by Part I.E.11 or

monitoring requirements dictated by Part I.F.6 of this Permit. Any changes to the approved design or construction specifications in Appendix C shall require prior Executive Secretary approval.

12. Future Modification of Disposal Cell Engineering Design or Specifications - any change in the approved engineering design or specifications which causes a significant adverse effect to the infiltration performance of a disposal cell shall require prior submittal and Executive Secretary approval of infiltration and contaminant transport analysis of the proposed change. Said changes must be submitted to the Executive Secretary as a written request with the revised engineering drawings, specifications, ground water flow and contaminant transport models, or any other documentation deemed necessary by the Executive Secretary, at least 180 days prior to the effective date desired by the Permittee.
13. Final Authorized Engineering Design and Specifications for Waste and Wastewater Related Facilities - best available technology design standards for related facilities at the disposal site shall be defined by, and construction conform to the engineering plans and specifications summarized in Table 5, below, and specifications listed in the approved LARW Construction Quality Assurance/Quality Control Plan (Radioactive Materials License, Condition 44).

TABLE 5. Approved Engineering Design Drawings for Waste/Wastewater Related Facilities

Related Facility	Drawing No.	Last Revision	Subject / Title
Admin. Building Decon. Pad	9510-1, Rev. B	May 26, 1996	Plan, Section, and Details
Track 2 Railcar Decon. Pad	9513-1, Rev. B	May 26, 1996	Plan, Section, and Details
Track 4 Railcar Decon. Pad	T-100, Rev. 3	Aug. 14, 1999	Foundation
	T-101, Rev. 3	Aug. 16, 1999	Foundation Details
	9906-02, Rev. B	July 31, 2002	Wash Water System As-Built
	9906-02A, Rev. C	Aug. 26, 2002	Wash Water System As-Built
LARW Operations Building Wash Bay	9612-1, Rev. A	July 19, 1996	Wash Bay Floor and Drain
	9807-1, Rev. A	March 19, 1998	Wash Bay Sediment Basin
	9807-2, Rev. A	March 19, 1998	Wash Bay Sediment Basin
	9807-3, Rev. C	Aug. 17, 1998	Wash Bay Floor and Drain
1995 LARW Evaporation Pond	9718-1, Rev. B	Aug. 17, 1998	Facility Layout
	9504-3, Rev. E	Oct. 28, 1999	Storage Pond
	9504-3A, Rev. A	Oct. 28, 1999	Leak Detection System Details, As-Built
	9504-4, Rev. E	Oct. 28, 1999	Facility Details
	9718-4, Rev. A	Aug. 17, 1998	Piping Diagrams and Pump Station
1997 LARW Evaporation Pond	9718-1, Rev. B	Aug. 17, 1998	Facility Layout
	9718-2, Rev. D	Feb. 25, 1999	Evaporation and Storage Pond
	9718-2a, Rev. B	Feb. 25, 1999	Leak Detection System Details, As-Built
	9718-3, Rev. -	Sept. 17, 1997	Details
	9718-4, Rev. A	Aug. 17, 1998	Piping Diagrams and Pump Station
2000 LARW Evaporation Pond	0009-00, Rev. A	July 10, 2000	Site Plan and Facility Layout
	0009-01, Rev. -	May 2, 2000	Plan View
	0009-02, Rev. -	May 2, 2000	Cross Sections

	0009-03, Rev. -	May 2, 2000	Details
	0009-04, Rev.-	May 2, 2000	Sump/Side Slope Cross-Section
	0009-05, Rev.-	May 2, 2000	Leak Detection Details
Mixed Waste Evaporation Pond	9802-1, Rev. D	Dec. 22, 1999	Facility Layout
	9802-2, Rev. F	Dec. 22, 1999	Water Storage Facility
	9802-3, Rev. D	Dec. 22, 1999	Facility Details As-Built
	9802-4, Rev. B	Dec. 4, 1998	Water Storage Facility
	9802-5, Rev. A	Dec. 22, 1999	Leak Detection System Details As-Built
	9803-2, Rev. -	Feb. 11, 1998	Storage Pad Drain Line As-Built
Box Washing Facility	9621-1, Rev. C	July 20, 1998	Site Plan As-Built Drawing
	9621-2, Rev. B	July 20, 1998	Foundation Plan As-Built Drawing
	9621-3, Rev. B	July 20, 1998	Elevation Views As-Built Drawing
	9621-4, Rev. B	July 20, 1998	Elevation Views As-Built Drawing
	9621-5, Rev. B	July 20, 1998	Wall Detail As-Built Drawing
	9621-6, Rev. F	May 17, 2000	As-Built Plan, Settlement Basin Retrofit
	9621-7, Rev. E	May 17, 2000	As-Built Cross Sections, Basin Retrofit
Intermodal Unloading Facility	9705-1, Rev. A	July 31, 1998	Plan View
	9705-2, Rev. A	July 31, 1998	Cross Section Drawings
	9813-01, Rev. A	July 31, 1998	Layout
	9813-02, Rev. A	July 31, 1998	Layout (and Details)
	9301-1, Rev. K	Sept. 23, 1998	Site Plan and Facility Layout
Railcar Rollover Facility	0221-01	March 26, 2002	Site Layout and Drain Line
	0221-02	March 26, 2002	Fabric Cover Frame Layout
	0221-03	March 26, 2002	Rollover Cover South Elevation
	0221-04, Rev. A	April 24, 2002	Cover Run-off Collection & Drainage

14. Authorized Mixed Waste Cell Engineering Design and Specifications - the best available technology standards for the Mixed Waste Cell shall be defined by those requirements mandated by the Utah Division of Solid and Hazardous Waste RCRA Permit, issued November 30, 1990 (as amended), hereafter DSHW RCRA Permit. All Mixed Waste Cell engineering design and specifications shall comply with DSHW RCRA Permit, Module V, Attachment V-1. ~~All Mixed Waste Cell construction shall conform to all construction quality assurance/quality control requirements mandated by the DSHW RCRA Permit, Module II, Attachment II-9.~~

E. BAT Performance and Best Management Practice Standards

1. Waste Restrictions -

- a) LARW Cell and Mixed Waste Cell - waste to be disposed of in the LARW or Mixed Waste Disposal Cells shall be limited exclusively to those bulk radioactive materials defined in Conditions 6, 7, and 8 of the Utah Radioactive Materials License UT 2300249. Any change effecting these Conditions of the Radioactive Materials License, resulting in additional types of wastes to be disposed of in the LARW Disposal Cell or any increase in waste concentration, after issuance of this

Permit, shall require prior approval from the Executive Secretary of the Water Quality Board, after submittal of satisfactory technical justification in accordance with applicable requirements of the Utah Licensing Requirements for Land Disposal of Radioactive Waste (UAC R447-25).

- b) 11e.(2) Waste - any change effecting the non-radiologic content of the waste to be disposed of in the 11e.(2) Cells, including additional types or concentrations of non-radiologic contaminants, above and beyond those defined in Table 6 below, shall require prior approval from the Executive Secretary, after submittal of satisfactory technical justification to demonstrate that the requirements of Part I.D.1 of this Permit will be met.
- c) Solid Waste Landfill Equivalency - PCB/Radioactive Waste as defined in Appendix I shall only be disposed of as designated in Appendix I.
- d) Class A Cell - waste to be disposed of in the Class A Cell shall be limited to wastes which meet the definition of Class A Low-Level Radioactive Waste (LLRW) under the Utah Radiation Control Rules, UAC R313-15-1008, or are defined as Naturally Occurring and Accelerator Produced Radioactive Materials under the Utah Radiation Control Rules, UAC R313-12-3.

2. Prohibited Wastes -

- a) Hazardous Waste - the disposal of hazardous waste as defined by the Utah Hazardous Waste Management Rules (UAC R315-2-3) is prohibited in the LARW, Class A, and 11e.(2) Disposal Cells. The disposal of any LARW, Class A, or 11e.(2) waste that exceeds the regulatory concentration levels of the Toxic Characteristic Leaching Procedure (TCLP) as defined in 40 CFR Part 261 Subpart C, Table 1 is prohibited, unless specifically authorized in Table 6A or 6B, below. Waste samples shall be collected in accordance with the currently approved LARW Waste Characterization Plan (Radioactive Materials License, Condition 58) or the Procedure for Certification of 11e.(2) Waste in Appendix E of this Permit, and analyzed for those exclusive parameters listed in Table 6A and 6B, below and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I. Leachate concentrations from the TCLP test shall not exceed the maximum allowable concentrations in Table 6A and 6B, below. The Permittee may use the results of Total analyses to determine whether a TCLP limit may be exceeded by dividing the Total analytical result by 15 and comparing the quotient against the TCLP limit to determine if the waste is hazardous.

TABLE 6A: Maximum Allowable Concentrations in LARW & Class A Waste

Parameter	TCLP Leachate Concentrations (mg/l)		Total Waste Concentration (mg/kg)
	Regulatory	Maximum	
<i>Metals</i>			
Arsenic	5.0	ncls ⁽¹⁾	ncls
Barium	100.0	ncls	ncls
Cadmium	1.0	ncls	ncls
Chromium	5.0	ncls	ncls
Copper	n/a	ncls	ncls
Lead	5.0	ncls	ncls
Mercury	0.2	ncls	ncls
Selenium	1.0	ncls	ncls
Silver	5.0	ncls	ncls
Zinc	n/a	9,670	967

(1) ncls = no concentration limit specified.

The disposal of any waste that exceeds the Maximum Allowable TCLP Leachate Concentration or Total Waste Concentration in Table 6A or Table 6B is prohibited without prior written approval from the Executive Secretary. The disposal of any LARW or 11e.(2) Waste which exceeds the TCLP regulatory concentrations for organic compounds identified in 40 CFR 261.24, Table 1, is expressly prohibited without prior written approval from the Executive Secretary.

TABLE 6B: Maximum Allowable Concentrations in 11e.(2) Waste

Parameter	TCLP Leachate Regulatory Limit (mg/l)	Total Waste Concentration (mg/kg)
<i>Volatile Organic Compounds</i>		
Acetone	n/a	10.0
2-Butanone	200.0	10.0
Carbon Disulfide	n/a	10.0
Chloroform	6.0	10.0
1,1-Dichloroethane	0.5	10.0
Diethyl Phthalate	n/a	80.0
Methylene Chloride	n/a	70.0
2-Methylnaphthalene	n/a	80.0
Naphthalene	n/a	80.0
1,1,2-Trichloroethane	n/a	7.27
Vinyl Chloride	0.2	0.66

- b) ~~Free Liquids—the disposal of free liquids shall also be prohibited. Liquid content of all wastes shall be monitored and controlled pursuant to the currently approved LARW Waste Characterization Plan and the LLRW Waste Management Plan in the Radioactive Materials License, Conditions 58 and 59, respectively, and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I, or the Mixed~~

~~Waste requirements found in the DSHW RCRA Permit, including Attachment II-1-~~
14. Liquid Waste – acceptance of liquids and liquid content of all wastes shall be in accordance with the Radioactive Materials License.

- c) Chelating Agents - the disposal of any waste containing chelating agents shall be limited to the Mixed Waste Cell and is prohibited in the LARW, Class A, and 11e.(2) Disposal Cells. The disposal of any waste in the Mixed Waste Cell containing chelating agents in excess of 22% by weight is prohibited.
- 3. Failure to Construct as per Approval - Failure to construct any portion of the facility in compliance with the approved engineering design and specifications or in a manner inconsistent with the applicable CQA/QC Plan (Radioactive Materials License, Condition 44 or Appendix D of this Permit) shall be cause for the Executive Secretary to require excavation of the materials and remedial construction, retrofit of the embankment or any other mitigative action to prevent the release of pollutants to soil or ground water.
- 4. Unsaturated Soil Moisture Content Monitoring - the Permittee shall conduct soil moisture content monitoring to verify performance of the engineered containment systems for the LARW, 11e.(2), and Class A Disposal Cells. This monitoring shall consist of instrumentation, as approved by the Executive Secretary, installed in both:
 - a) The Cover Test Cell, and
 - b) The Unit 3 sand along the west margin of the LARW Cell.

This instrumentation and required monitoring shall be used by the Executive Secretary to observe any trend in soil moisture content which may indicate failure of the containment system to control the contaminants disposed of in the embankment. All monitoring shall be conducted in compliance with the modified Water Monitoring Quality Assurance Plan dated August 2, 2002 and provided in Appendix B of this Permit. The Permittee shall maintain and replace all soil moisture instrumentation in compliance with the approved plan required by Part I.I.1 of this Permit, or as directed by the Executive Secretary.

The Executive Secretary reserves the right to require similar soil moisture content monitoring in the radon barrier at either of the 11e.(2) Cells. The Permittee shall install and make operational any soil moisture instrumentation in compliance with the schedule to be determined by the Executive Secretary.

- 5. Installation of Additional Vadose Zone Monitoring - upon any exceedance of the ground water protection levels in leachate which accumulates in the collection lysimeters at the LARW Cell or Class A Cell required by Part I.D.11 or I.F.6 of this Permit or upon any increasing soil moisture trend in the Unit 3 sand, as determined by the Executive Secretary and as outlined by Part I.I.1 of this Permit, the Permittee shall:
 - a) Submit a plan for the installation of vadose zone monitoring devices at the perimeter of the disposal cell(s) in question within 30 days of discovery for Executive Secretary approval. These devices may include suction lysimeters,

observation wells, or other devices in accordance with applicable EPA or NRC guidance.

- b) Install and make fully operational the vadose zone monitoring equipment within 30 days and using the same infiltration model used by ABC and Whetstone Associates for the LARW and Class A Cells, respectively, of Executive Secretary approval.
6. Open Cell Time Limitation - for each open portion of any disposal cell, the radon barrier shall be constructed and completed in accordance with the approved engineering plans and specifications (Part I.D.2, 3, and 4) within six years of the date of initial placement of the first lift of any LLRW waste in that portion of the open cell. Any modification of this six-year limitation shall require submittal of ground water flow and contaminant transport modeling of open cell conditions or other technical information as necessary, and prior Executive Secretary approval. Said modeling report or other studies must be submitted in their entirety to the Executive Secretary 180 days prior to the expiration date of the six-year open cell time limit. Failure to secure Executive Secretary approval prior to expiration of the six-year deadline shall not be cause for the Permittee to postpone construction of the cover of any cell in accordance with the currently approved engineering design and specifications in Part I.D.2 or 3 or 4 of this Permit.
7. General Storm Water Management Requirements - the Permittee shall contain all storm water runoff at the LARW, Class A, and 11e.(2) Disposal Cells which has contacted the waste (i.e., contact stormwater), including runoff from:
- a) Waste disposed in excavated, below grade, areas of the LARW, Class A, and 11e.(2) Disposal Cells, and
 - b) Waste stored on unexcavated portions of the 11e.(2) Disposal Cells.

Said containment inside the LARW, Class A, and 11e.(2) Cells shall include control and maintenance of the storm water runoff over a clay liner which has been constructed in compliance with an applicable Construction Quality Assurance/Quality Control Plan. Removal and disposal of contact storm water shall comply with the following requirements:

- c) Within 24-hours of discovery of an accumulation of contact stormwater, the Permittee shall immediately begin pumpage and removal of said wastewater in compliance with the following priority schedule, ranked from highest to lowest priority:
 - 1) Contact stormwater inside the footprint of the LARW, Class A, and 11e.(2) Disposal Cells,
 - 2) Contact stormwater at the LARW Rollover Facility, and
 - 3) Contact stormwater at the Intermodal Unloading Facility.

The Permittee shall pump and remove contact stormwater in an uninterrupted manner until it is completely removed from said location. Under no circumstance will the Permittee begin pumpage and removal of contact stormwater at a lower priority location without first completing removal at all higher priority location(s).

- d) All contact stormwater accumulated and pumped shall be disposed of only in the approved LARW or Mixed Waste Evaporation Ponds. However, LARW and 11e.(2) Cell contact stormwater may be used for minimal engineering and dust control purposes on the waste in the LARW and Class A Cells.
 - e) Class A Containerized Waste Facility Evaporation Basin – precipitation that falls on the Class A Containerized Waste Facility shall be allowed to accumulate in an engineered evaporation basin constructed behind the containerized waste facility in accordance with the following conditions:
 - 1) the evaporation basin shall be constructed in accordance with the design specifications in engineering drawings 0041-02 and 0041-03 contained in the Request For License Amendment, Containerized Class A LLRW Disposal (Revision 1, 4/12/01), and the requirements of the currently approved Construction Project Plan for the LLRW Embankment.
 - 2) Fluid head in the evaporation basin shall not exceed a 1-foot level above the lowest point of the bottom clay liner of the basin. The occurrence of fluid levels above this 1-foot maximum allowable head limit shall constitute a violation of this Permit.
 - 3) The Permittee shall ensure that the physical integrity of the clay liner is not compromised by desiccation or freeze/thaw cycles by implementing quality assurance/quality control requirements in the currently approved Construction Project Plan for the LLRW Embankment.
8. 11e.(2) Waste Management Requirements - the Permittee shall manage the 11e.(2) Waste and related activities at the facility in accordance with all applicable requirements of the currently approved ~~LLRW Waste Management Plan (RML Condition 59)~~ Radioactive Materials License for the following activities and procedures:
- a) Spill response and prevention
 - b) Runon and runoff containment
 - c) Decontamination of vehicles, equipment, and containers
 - d) Unloading procedures
 - e) Waste storage time limits
 - f) Storm water/wastewater collection and disposal
 - g) Leaking waste shipments

In addition, the Permittee shall manage 11e.(2) waste storage and handling in compliance with the containment and spill prevention requirements of Part I.E.10.a of this Permit.

9. 11e.(2) Waste Storage - storage of 11e.(2) Waste at the facility shall be explicitly limited to unexcavated areas within the confines of the 11e.(2) Disposal Cells. Said disposal shall be over areas of native grade and consist of clays which have been scarified and compacted in compliance with the 11e.(2) Waste Construction Quality Assurance/Quality Control Plan found in Appendix D of this Permit.
10. LARW and Class A Waste ~~Storage~~ Management Performance Requirements - ~~storage of all LARW and Class A waste shall be restricted to the: 1) LARW Container and Bulk Unloading Area, 2) the LARW Container Storage Area, or as otherwise specified in the LARW Waste Management Plan (RML Condition 59) and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I. In addition, the Permittee shall operate and maintain these waste storage and related~~ all facilities in compliance with the following performance requirements:
- a) Contaminant Containment and Spill Prevention - the Permittee shall ~~operate and maintain all waste off-loading, handling, and storage facilities~~ manage all site operations to:
- 1) Prevent contact of wastes with the ground surface.
 - 2) Prevent spills of wastes or liquids contained therein from any contact with the ground surface or ground water.
 - 3) Prevent contact of surface water or stormwater run-on with the waste.
 - 4) Control any run-off, which may have contacted the waste from subsequent contact with the ground surface or ground water by means of approved engineering containment. Any accumulations of such contact run-off or leachates ~~within the confines of a waste off-loading, handling, and/or storage area~~ shall be immediately removed and placed for evaporation disposal in the LARW Evaporation Ponds.
 - 5) Prevent wind dispersal of wastes.
 - 6) Minimize the time any waste is held in temporary storage ~~at the LARW Container and Bulk Unloading Area, or Containerized Waste Storage Pad~~ without disposal in the embankment. In no case shall any waste be stored ~~at these facilities~~ beyond ~~180~~ 365 days after date of waste entry into the controlled area.
 - 7) Identify all wastes held in storage by use of clear and legible placards, signs, or labels which identify the generator, waste stream number and dates that said waste or waste container both entered the controlled area and was placed into temporary storage.
 - 8) Maintain all waste containers in a closed, strong tight and watertight condition.
 - 9) Open-air storage of PCB/Radioactive Waste is prohibited.

10) All containers in storage shall be inspected daily.

11) Waste in bags shall be managed as bulk waste.

b) ~~LARW Container and Bulk Unloading Area~~ shall be operated and maintained in compliance with the following minimum requirements and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I, as applicable:

~~1) Containerized Waste Storage Limitation~~—any waste stored in this area shall be maintained in closed watertight containers. Any open-air storage of waste in bulk form on the LARW Container and Bulk Unloading Area is prohibited. The Permittee shall manage waste in containers in compliance with the LLRW Waste Management Plan (RML Condition 59).

~~2) Bulk Waste Unloading Limitations~~—unloading of bulk waste in this area shall be limited to unloading between railcars and waste haul trucks, or from railcar to containers. Any waste unloading that includes intentional dumping of waste on the surface of the LARW Container and Bulk Unloading Area shall be expressly prohibited.

~~3) Cleanup of Waste Unloading Spillage~~—in the event that bulk waste is accidentally spilled onto the surface of the LARW Container and Bulk Unloading Area during waste unloading, the Permittee shall immediately clean up all waste spillage in accordance with the LLRW Waste Management Plan within 24 hours of discovery.

~~4) Container Leakage~~—any container observed to be leaking waste shall be immediately overpacked or properly disposed in the embankment within 24 hours of initial discovery. Any container observed to be leaking fluids shall be remediated within 24 hours of initial discovery in accordance with the leaking shipment management requirements of the LLRW Waste Management Plan (RML Condition 59).

~~5) Control of Vehicle Weight to Prevent Liner Damage~~—the Permittee shall prevent any additional damage to the LARW Container and Bulk Unloading Area through careful control and management of vehicle, container, and equipment weight. Any vehicular traffic or static load that causes contact pressures on the working surface in excess of the maximum limits approved by the Executive Secretary pursuant to Part I.I.2 of this Permit, or could otherwise cause damage to the underlying flexible membrane or clay liner system shall be expressly prohibited.

~~6) Operation and Maintenance of Stormwater and Leak Collection Systems~~—the Permittee shall operate and maintain the LARW Container and Bulk Unloading Area so as to ensure free drainage of both the stormwater and leak collection systems and minimize any hydraulic head therein. Under no circumstance shall the Permittee allow fluids in the Northeast Stormwater Collection Manhole to

~~accumulate at any time above the bottom elevation of the inlet pipe. Under no circumstances shall the Permittee allow fluids in the Northwest Leak Collection Observation Manhole to fill the collection cup without obtaining a water quality sample for laboratory analysis. At no time shall fluid be allowed to accumulate in the manhole. In the event that fluid is present in the manhole, the Permittee shall immediately collect a water quality sample for laboratory analysis and implement an investigation to determine the source of the fluid. The Permittee shall also properly operate and maintain drain pipeage from both of these manholes to ensure free and uninterrupted drainage and total conveyance of fluids to the LARW Evaporation Ponds.~~

- b)e) Containerized Waste Storage Pad - the Permittee shall operate and maintain waste containers and the asphalt surface of the Containerized Waste Storage Pad so as to prevent the discharge of storm water or leachate to subsurface soils or ground water, by completing the following actions. Also, for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I as applicable:
- 1) Repair or otherwise seal and render impermeable any and all cracks, ruptures, damage, or porous areas found in the asphalt surface as soon as possible after discovery.
 - 2) Fill any areas of subsidence and return the asphalt surface to its original design grade permeability, and appearance, in order to prevent the impoundment of any storm water or leachate on the pad as soon as possible after discovery.
 - 3) Prevent contact of waste with precipitation or stormwater by maintaining all containers in a closed and watertight condition.
 - 4) ~~Remediate leaking containers within 72 hours of initial discovery. Leakage of waste shall be remediated by immediate container overpack or by proper disposal in the embankment. Leakage of fluids shall be remediated in accordance with the leaking shipment management requirements of the LLRW Waste Management Plan (RML Condition 59)~~ Manage leaking containers in accordance with the Waste Characterization Plan and Radioactive Materials License.
 - 5) Adequately operate and maintain the stormwater collection sump, pump, and pipeage to ensure containment and conveyance of stormwaters to the LARW Evaporation Ponds. Under no circumstances are stormwaters to be maintained in the collection sump for more than 72 hours at any time.
- d) ~~Restrictions for~~ Management and Temporary Storage of Mobile Waste –
- 1) All temporary storage of mobile waste, as defined by Part I.D.6 of this Permit, shall be limited to only ~~the LARW Container and Bulk Unloading Area, or the~~ Containerized Waste Storage Pad.

- 2) Open-air storage of mobile waste is expressly prohibited.
 - 3) Portions of equipment, which have come in contact with Mobile Waste, shall be cleaned to a limit of 500 grams per ft² average.
 - 4) Equipment decontamination must be performed within the Class A or LARW Cell areas or on approved decontamination facilities.
 - e) Prohibition and Restrictions for Dry Active Waste Storage - dry active waste is defined as contaminated materials without soil-like texture or characteristics, and have a dry weight density of 70 pounds per cubic foot or less (e.g. contaminated paper, plastic, personal protective equipment, cloth, or other similar soft-type debris). Open-air storage of dry active waste is prohibited at the facility. All temporary storage of dry active waste shall be conducted either inside buildings or in watertight containers at the ~~LARW Container and Bulk Unloading Area, or the~~ Containerized Waste Storage Pad.
 - f) Intermodal Unloading Facility - the Permittee shall operate and maintain the LARW Intermodal Unloading Facility to provide free draining conditions on both the unloading pad and in the stormwater drainage pipeline system.
11. LARW Cell and Class A Cell Collection Lysimeters: Operation, Maintenance and Annual Inspection - the Permittee shall operate and maintain all collection lysimeters in compliance with Appendix C of this Permit. Said operation shall include at least an annual video log inspection of each collection lysimeter constructed at the LARW Cell and Class A Cell. Each video inspection shall log the entire length of the drainage pipe to ensure proper operation and free drainage of each collection lysimeter. Failure to satisfactorily complete an annual video log inspection or a determination that free draining conditions no longer exist in a collection lysimeter shall constitute failure to maintain best available technology pursuant to Part I.G.4 of this Permit. Such failures shall be reported to the Executive Secretary in accordance with the requirements of Part I.H.10 of this Permit.
12. Storm Water Drainage Works Performance Criteria - all storm water drainage works constructed and operated at the LARW, Class A, and 11e.(2) facilities shall be performed in accordance with the following criteria:
- A. Seepage Control to Prevent Ground Water Mounding - all drainage works at the facility shall be constructed of either low-permeability clay liner materials or of an impermeable man-made conveyance in order to control and prevent any alteration of local natural ground water hydraulic gradients or velocities. This infiltration control shall address seepage during periods of storm water storage in the drainage system.
 - B. Free Drainage - all storm water drainage works shall be free draining and under gravity conditions shall convey storm water from the contributing facilities to an off-site location.

13. 11e.(2) Clay Layer Approval - before placement of overlying materials, the Permittee shall secure Executive Secretary approval of construction of final clay liner and radon barrier layers at the 11e.(2) Cell.
14. Wastewater Management Requirements -the Permittee shall operate and maintain all wastewater storage, treatment, and disposal facilities in accordance with Best Available Technology requirements approved by the Executive Secretary, as follows:
 - a) 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds - the Permittee shall operate and maintain the 1995 LARW, 1997 LARW, and 2000 LARW Evaporation Ponds and the Mixed Waste Evaporation Pond to prevent release of fluids to subsurface soils or groundwater, in accordance with the following requirements:
 - 1) Leak Detection System Pumping and Monitoring Equipment Continuous Operation - the Permittee shall provide continuous operation of the leak detection system pumping and monitoring equipment, including, but not limited to, the submersible pump, pump controller, head/pressure transducer, and flow meter equipment approved by the Executive Secretary. Failure of any pumping or monitoring equipment not repaired and made fully operational within 24-hours of discovery shall constitute failure of Best Available Technology and a violation of this Permit.
 - 2) Maximum Allowable Daily Leakage Volumes - the Permittee shall measure the daily volume of all fluids pumped from the respective leak detection systems of the 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds. Under no circumstance shall the daily leak detection system flow volume, as determined pursuant to Part I.F.15.a.3, exceed the following limits:

i) 1995 LARW Evaporation Pond:	162 gallons/day
ii) 1997 LARW Evaporation Pond:	171 gallons/day
iii) Mixed Waste Evaporation Pond:	171 gallons/day
iv) 2000 LARW Evaporation Pond:	382 gallons/day

Daily leak detection system flow volumes in excess of these limits shall constitute failure of Best Available Technology and a violation of this Permit.

- 3) Maximum Allowable Head - the Permittee shall measure fluid head in the respective leak detection sumps of the 1995 LARW, 1997 LARW, 2000 LARW, and the Mixed Waste Evaporation Ponds by use of pressure transducer equipment approved by the Executive Secretary. Under no circumstance shall fluid head in the leak detection system sump exceed a 1-foot level above the lowest point in the lower flexible membrane liner. The occurrence of leak detection system fluid levels above this 1-foot limit shall constitute failure of Best Available Technology and a violation of this Permit.

- 4) 2-foot Minimum Vertical Freeboard Criteria - the Permittee shall operate and maintain at least 24 inches of vertical freeboard in the 1995 LARW, 1997 LARW, 2000 LARW, and the Mixed Waste Evaporation Ponds to ensure total containment of fluids. This vertical distance shall be determined by use of a gauging station approved by the Executive Secretary. If at any time the Permittee operates the pond with less than 24 inches of vertical freeboard, such operation shall constitute failure of Best Available Technology and a violation of this Permit.
 - 5) PCB Monitoring - the Permittee shall monitor for PCBs according to the requirements of this Permit, or its appendices, or as required by the Executive Secretary.
 - ~~b) LARW Operations Building Wash Bay - the Permittee shall operate and maintain the LARW Operations Building Wash Bay to prevent direct or in-direct discharge of wastewater to subsurface soils or groundwater. In addition, the Permittee shall:~~
 - ~~1) Operate the wash bay to ensure free draining conditions, and~~
 - ~~2) Maintain the integrity of the concrete working surface to prevent discharge.~~
 - b)** Box-Washing Facility - the Permittee shall operate and maintain the Box-Washing Facility to ensure:
 - 1) Free draining conditions exist both at the floor sumps and across the wastewater drainage pipeline that discharges to the 1995 and 1997 LARW Evaporation Ponds.
 - 2) The integrity of the concrete working surface to prevent discharge,
 - 3) The sediment basin provides a total containment system and does not cause a direct or in-direct discharge to subsurface soils or groundwater. Water level in the sediment basin shall always be maintained at or below the elevation of the outlet pipe.
 - 4) The occurrence of fluids in the leak detection system shall constitute a failure of Best Available Technology and a violation of this Permit.
 - d) Rail Car Wash Facilities - the Permittee shall operate and maintain the new Rail Car Wash Facility on Track No. 4 and the old Rail Car Wash Facility on Track No. 2 in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.
15. Filter Construction Settlement Performance Standards - cover system filter placement shall begin only after the Permittee demonstrates that 95% of the maximum consolidation has been achieved at the upper surface of the radon barrier.

Any filter construction undertaken without this demonstration and prior Executive Secretary approval shall constitute a violation of this Permit.

16. Mixed Waste Cell BAT Performance and Best Management Practice Standards - performance and best management practice standards for waste storage, and stormwater and wastewater storage, treatment, and disposal at the Mixed Waste Cell shall be defined by requirements mandated by the DSHW RCRA Permit.
17. Railcar Rollover Facility BAT Performance and Best Management Practice Standards – the Permittee shall operate and maintain the railcar rollover facility to ensure the physical integrity and the asphalt ramps and concrete bay to prevent discharge to the subsurface. Daily inspections shall be documented to ensure compliance with the storm water management requirements in Part I.E.7c.2.

On an annual basis during the first quarter of each year, the Permittee shall remove all waste from the facility, pressure wash all surfaces to remove all foreign material, and inspect the entire concrete bay and asphalt ramps of the rollover facility. The Permittee shall repair or otherwise seal and render impermeable any and all cracks, ruptures, damage, or porous areas prior to resuming use of the facility. The Permittee shall submit a written notice of inspection to the Executive Secretary at least one week prior to the annual inspection to allow the Executive Secretary the opportunity to have a DRC representative present.

18. Evaluation of Effect of Proposed Pumping Well(s) - the Permittee will evaluate the effect of any proposed pumping well at the facility on the local ground water flow field and ground water monitoring. This evaluation will be undertaken with the use of analytical or numeric ground water flow models, which conform to the guidance provided to Envirocare by the Bureau of Radiation Control in the November 26, 1990 Notice of Deficiency, Comment WPC-1 K. The Permittee will submit the results of this evaluation and receive Executive Secretary approval before any construction of the withdrawal well.

F. Compliance Monitoring

1. Compliance Monitoring Wells – ground water monitoring wells used as compliance monitoring points shall meet the following requirements:
 - a) LARW, Class A, and 11e.(2) Compliance Monitoring Wells - the following wells identified in Envirocare of Utah Site Survey by Pentacore EPG dated April 24, 2000, shall be sampled and analyzed for purposes of compliance monitoring:
 - 1) LARW Cell - existing wells I-2-30, GW-16R, GW-20, GW-22, GW-23, GW-24, GW-29, GW-56R, GW-64, GW-77, GW-103, GW-104, and GW-105.

- 2) 11e.(2) Cell - existing wells GW-19A, GW-20, GW-24, GW-25, GW-26, GW-27, GW-28, GW-29, GW-36, GW-37*, GW-38R*, GW-57, GW-58, GW-60, and GW-63, GW-126, and GW-127.

* Wells 37 and 38R shall be monitored only for ground water elevations.

- 3) Class A Cell - existing wells GW-81, GW-82, GW-83, GW-84, GW-85, GW-86, GW-88, GW-89, GW-90, GW-91, GW-92, GW-93, GW-94, GW-95, GW-99, GW-100, GW-101, and GW-102.
- b) Mixed Waste Cell Compliance Monitoring Wells (radiologic contaminants only)- including wells defined on Envirocare drawing 0201-KO6 Rev. B, dated January 6, 2003 shall be sampled and analyzed for purposes of compliance monitoring, as follows: GW-41, GW-42, GW-66, GW-67, GW-68, GW-69, GW-70, ~~GW-71, GW-79, GW-80,~~ GW-118, GW-119, GW-120, GW-121, GW-122, GW-123R, GW-124, and I-1-30.
- c) Evaporation Pond Monitoring Wells - monitoring wells P3-95 NEC, P3-95 SWC, and P3-97 NEC shall be sampled and analyzed for purposes of compliance monitoring for the LARW Ponds, and well GW-66 shall be sampled and analyzed for purposes of compliance monitoring for the Mixed Waste Pond.
- d) Well Construction Criteria - any groundwater monitoring well used as a compliance monitoring point shall be:
- 1) Located hydrologically downgradient of waste disposal,
 - 3) Completed exclusively in the uppermost aquifer,
 - 3) Located as close as practicable to the waste and no more than 90 feet from edge of waste,
 - 4) Constructed in conformance to guidelines found in the EPA RCRA Ground Water Monitoring Technical Enforcement Guidance Document, 1986, OSWER-9950.1.
- e) Well Network Early Warning Requirement - any network of groundwater monitoring wells used as points of compliance shall be adequately constructed, both in location and spacing, to provide early warning of a contaminant release from a waste embankment before the contaminant leaves the embankment's 100-foot wide buffer zone, as defined in Table 7, below. For purposes of this Permit, early warning shall be provided by a compliance monitoring well network with an inter-well spacing distance to be approved by the Executive Secretary pursuant to Part I.I.6 of the Permit.
- f) Buffer-Zone Requirements - waste disposal is prohibited inside the buffer zone, as described in Tables 3 and 7 of this Permit.

TABLE 7. Buffer Zone Boundary Locations

Disposal Cell	Edge of Buffer Zone Position	Latitude and Longitude Coordinates	
		Latitude	Longitude
LARW	NW Corner	40° 41' 11.839937" N	113° 6' 52.144756" W
	SW Corner	40° 40' 51.390522" N	113° 6' 52.483065" W
	SE Corner	40° 40' 51.242105" N	113° 6' 35.313888" W
	NE Corner	40° 41' 11.689043" N	113° 6' 35.074346" W
Class A	NW Corner	40° 41' 28.993053" N	113° 7' 25.146795" W
	SW Corner	40° 41' 13.186476" N	113° 7' 25.452238" W
	SE Corner	40° 41' 12.729096" N	113° 6' 53.528644" W
	NE Corner	40° 41' 28.535969" N	113° 6' 53.222876" W
11e.(2)	NW Corner	40° 41' 13.520469" N	113° 7' 25.336344" W
	SW Corner	40° 40' 54.015381" N	113° 7' 25.983192" W
	SE Corner	40° 40' 53.390682" N	113° 6' 54.216013" W
	NE Corner	40° 41' 12.901791" N	113° 6' 53.560833" W

- g) Protection of Monitoring Network - all compliance monitoring wells must be protected from damage due to surface vehicular traffic or contamination due to surface spills. All monitoring wells shall be maintained in full operational condition for the life of this Permit.

The criteria for determining full operational condition are:

- 1) Accessibility - each well must be accessible for sampling and shall not be located in an area of standing water.
- 2) Casing Measuring Point - each well shall have a permanent surveyed reference point such as the top of the protective casing.
- 3) Physical Integrity - any physical disturbance to any well, which may alter the surveyed water level measuring point is prohibited. In addition, all wells shall have an adequate surface seal around the well casing to prevent surface or storm water from entering the well.
- 4) Chemical Integrity - all well and sampling materials shall be constructed of inert materials to prevent the introduction of contaminants from leaching or corrosion.
- 5) Silt Content - if the measured water column of any well is less than 90% of the theoretical water column, the monitoring well shall be redeveloped prior to sampling.

Any well that becomes damaged beyond repair or is rendered unusable for any reason will be replaced by the Permittee within 90 days or as directed by the Executive Secretary.

2. BAT Compliance Monitoring Points - the Permittee shall inspect, sample, analyze, or otherwise monitor other points of compliance in order to confirm compliance with this Permit. These points or instruments shall include:

- ~~a) LARW Container and Bulk Unloading Area, Northwest Leak Detection and Northeast Leachate Collection Manholes - as found on the March 10, 1994 Envirocare drawing entitled: LARW Bulk Storage Pad Repair, Plan View As-Built, page 1.~~
 - a**) LARW Cell Suction Lysimeters - suction lysimeters SL-1, SL-2, SL-3, as identified in the August 1, 1994 2nd Quarter 1994 Ground Water Sampling Report, Figure 1.
 - b**) LARW Cell and Class A Cell Collection Lysimeters - all collection lysimeters constructed at the LARW Cell and Class A Cell in accordance with the requirements of Part I.D.11 of this Permit.
 - c**) LARW Containerized Waste Storage Pad - including monitoring of water in the stormwater collection sump and physical condition of containers on the pad.
 - d**) 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds - including monitoring of: 1) vertical freeboard at the water level gauging stations approved by the Executive Secretary, 2) operational status and required BAT performance parameters of all leak detection pump-back system equipment, including but not limited to, leak detection system pump, head pressure transducer, and flow meters required by Part I.E.14.a.2 of this Permit and approved by the Executive Secretary.
 - e**) Intermodal Unloading Facility - including monitoring of free draining conditions at both the unloading pad and throughout the length of the contact stormwater drainage discharge pipeline that discharges to the LARW Evaporation Ponds.
 - ~~g) LARW Operations Building Wash Bay - including monitoring of free draining conditions and physical condition and integrity of concrete surface in the wash bay.~~
 - f**) Box-Washing Facility - including monitoring of free draining conditions, physical condition and integrity of concrete floor and floor sumps, presence or absence of fluids in the settlement basin leak detection access pipe shown in Envirocare drawings 9621-6 Rev. F and 9621-7 Rev. E, dated May 17 2000, and free draining conditions along the wastewater drainage pipeline that discharges to the LARW Evaporation Ponds.
 - g**) Track No. 4 and Track No. 2 Rail Car Wash Facilities - including monitoring of free draining conditions and physical condition and integrity of rail bay concrete floor, floor sumps, conveyance pipe, Collected Water Receiver Tank, Filtered Water Storage Tank, and concrete secondary containment vault.
3. Future Modification of Compliance Monitoring Systems or Equipment - if at any time the Executive Secretary determines that additional systems, mechanisms or instruments are necessary to monitor ground water quality or Best Available

Technology compliance at the facility, the Permittee shall submit within 30 days of receipt of notification, a plan and compliance schedule to modify the compliance monitoring equipment, for Executive Secretary approval. Any failure to construct the required compliance monitoring system or equipment in accordance with the approved plan and schedule shall constitute a violation of this Permit.

4. Compliance Monitoring Period - monitoring shall commence upon issuance of this Permit, or upon:
 - a) Completion of each collection lysimeter in accordance with Part I.D.11 of this Permit.
 - b) Completion of the soil moisture instrumentation required by Part I.E.4.

Thereafter, compliance monitoring shall continue through the life of the Permit.

5. Monitoring Requirements and Frequency - measurements or analysis done for monitoring will be conducted in compliance with the requirements below, and reported to the Executive Secretary as per the requirements of Part I.H.
 - a) Water Level Measurements - water level measurements shall be made monthly in each monitoring well and piezometer. Measurements made in conjunction with semi-annual groundwater sampling shall be completed prior to any collection of ground water samples in accordance with the Water Monitoring Quality Assurance Plan in Appendix B of this Permit. These measurements will be made from a permanent single reference point clearly demarcated on the top of the well or surface casing. Measurements will be made to the nearest 0.01 feet.
 - b) Specific Gravity Measurements - ground water specific gravity measurements shall be made semi-annually in each monitoring well and piezometer in conjunction with each semi-annual ground water quality sampling event.
 - c) Ground Water and Pore Water Quality Sampling and Analysis - except for arsenic and molybdenum, grab samples of ground water from compliance monitoring wells and pore water from lysimeters (as available) will be collected for chemical analysis on a semi-annual basis, in conformance with Part II.A and B and the Water Monitoring Quality Assurance Plan in Appendix B of this Permit. Arsenic and molybdenum samples will be collected for chemical analysis every five years at License and Permit renewal.
 - 1) Ground/Pore Water Analytical Methods - methods used to analyze ground water samples must comply with the following:
 - i) Are methods cited in UAC R317-6-6.3A(13) or have been approved by the Executive Secretary in the Water Monitoring Quality Assurance Plan, Appendix B of this Permit, and

- ii) Have detection limits which do not exceed the Ground Water Quality Standards or Protection Levels listed in Tables 1A and 1C of this Permit.
 - 2) Analysis Parameters - the following analyses will be conducted on all samples collected for ground water monitoring:
 - i) Field Parameters - dissolved oxygen, pH, temperature, specific gravity, and specific conductance.
 - ii) Laboratory Parameters - including:
 - General Inorganic Parameters: Chloride, Sulfate, Carbonate, Bicarbonate, Sodium, Potassium, Magnesium, Calcium, bromide, iron, and total anions and cations,
 - Total PCBs if requested by the Executive Secretary according to the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I,
 - General Radiologic Parameter: potassium-40,
 - All Protection Level Parameters - individual analysis for all parameters found in Part I.C, Tables 1A, 1B, 1C, 1D, 1E, and 1F of this Permit, and
 - Radiologic Parameters for Wells at the 11e.(2) Cells, including: radium-226, radium-228, thorium-230, thorium-232, and total uranium.
 - 3) Arsenic and Molybdenum - arsenic and molybdenum samples will be collected for chemical analysis every five years at License and Permit renewal.
6. Suction and Collection Lysimeter Sampling - suction and collection lysimeter sampling shall be conducted in compliance with the modified Water Monitoring Quality Assurance Plan approved by the Executive Secretary, as provided in Appendix B of this Permit. Sample analysis shall conform to the requirements of Part I.F.5(c) of this Permit.

For collection lysimeters water quality samples shall be collected within 24 hours of initial discovery of fluid. The priority of sample parameters shall conform to Appendix C of this Permit, Executive Secretary Conditional Approval of November 27, 1992, with special emphasis on selection of mobile and predominant contaminants found within the capture area of the lysimeter.

7. Modification of Monitoring or Analysis Parameters - if at any time the Executive Secretary determines the monitoring or analysis parameters to be inadequate, the Permittee shall modify all required monitoring parameters immediately after receipt

of written notification from the Executive Secretary. Upon any change in the approved waste parameters defined in Conditions 6, 7, and 8 of the Utah Radioactive Materials License UT 2300249, dated September 10, 1993, the Permittee shall revise the Water Monitoring Quality Assurance Plan in Appendix B.

8. Waste Characterization Monitoring -

- A. LARW and Class A Waste - all LARW and Class A waste received by the Permittee shall be fully characterized to determine its chemical and radiological constituents and the presence and concentration of any chelating agents both before shipment and emplacement for disposal, in accordance with the requirements of the currently approved Waste Characterization Plan in the Radioactive Materials License, Condition 58 and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I. Said waste characterization shall include sampling and analysis of all contaminants authorized by Part I.E.1 and of those prohibited by Part I.E.2 of this Permit.
- B. 11e.(2) Waste - all 11e(2) Waste received by the Permittee shall be fully characterized both before shipment and after arrival at the facility to identify any new non-radiologic contaminants not authorized by this Permit by Parts I.C.1 and I.F.5.b.2. Said waste characterization shall include sampling and analysis of all non-radiologic contaminants prohibited by Part I.E.2 of this Permit.

The Permittee shall maintain records of all LARW , Class A, and 11e.(2) Waste sampling and analysis on site.

- 9. Waste Liquid Content Monitoring - all wastes received shall be tested in a representative manner by the Paint Filter Liquids Test in accordance with the currently approved LARW Waste Characterization Plan in the Radioactive Materials License, Condition 58. ~~Any wastes which fails the required Paint Filter Liquids testing upon arrival at the facility shall be rejected for receipt or disposal and returned to its place of origin or otherwise managed in accordance with the currently approved LARW Waste Management Plan, Radioactive Materials License, Condition 59 and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I~~ In accordance with UAC R323-15-1008(2)(a)(iv), solid waste received for disposal shall contain as little free standing and non-corrosive liquid as reasonably achievable, but shall contain no more free liquids than 1% of the volume of the waste. In the event that solid waste is received or observed to contain free liquids in excess of 1% by volume, the Licensee/Permittee shall immediately notify the Division of Radiation Control that the shipment(s) failed the requirements for acceptance.
- 10. Post-Closure Monitoring - post-closure monitoring shall conform to the requirements of the approved Post-Closure Monitoring Plan in Appendix F of this Permit.
- 11. ~~LARW Container and Bulk Unloading Area Monitoring - the Permittee shall conduct daily inspection of the LARW Container and Bulk Unloading Area in accordance~~

~~with the currently approved BAT Performance Monitoring Plan in Appendix J of the Permit, and for PCB/ Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I, to evaluate compliance with the Best Available Technology requirements of Part I.E.10 of this permit, including:~~

- ~~_____ A. Physical condition of the work surface,~~
- ~~_____ B. Visual observation of the northeast leachate collection system manhole to determine relative elevation of water surface inside manhole with respect to base of manhole inlet pipe, and the northwest leak collection observation manhole to determine fluid level in the collection cup.~~
- ~~_____ C. Container integrity and watertight status,~~
- ~~_____ D. Visual observation of any waste unloading spillage and completion of required cleanup.~~
- ~~_____ E. Types of vehicles, containers, and equipment used on the working surface and resulting contact pressures in pounds per square inch.~~

~~The Permittee shall maintain a written record of these inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit. The Permittee shall complete any other sampling or monitoring that may be required by the Executive Secretary in order to determine the compliance status of the facility.~~

1112. On-Site Meteorological Monitoring - the Permittee shall provide continuous monitoring of the following minimum meteorological parameters for the standard meteorological year of October 1 through September 30, in accordance with the approved Weather Station Monitoring Plan found in Appendix G of this Permit:

- A. Wind direction and speed.
- B. Temperature
- C. Daily Precipitation
- D. Pan evaporation

The Permittee shall maintain records of this monitoring on site. The Permittee shall submit an annual meteorological report for the facility in compliance with the requirements of Part I.H.11 of this Permit. The objective of this report shall be to show that the meteorological assumptions made in the infiltration and unsaturated zone modeling used to support issuance of the Permit were conservative or representative of the actual conditions at the site. In addition, and in conjunction with an application for permit renewal, 180 days before expiration of the Permit, the Permittee shall submit a summary report of all meteorological data collected since issuance of the last Permit (minimum of 4 years of data). Said report shall compare the data observed against regional normal values, as available, and provide summary statistics of all meteorological data collected.

~~12~~¹³. Containerized Waste Storage Area: Leakage/Spill Monitoring and BAT Status - the Permittee shall conduct daily inspections of the containerized waste storage area in order to remediate any container leakage or spillage in accordance with the currently approved BAT Performance Monitoring Plan in Appendix J of this Permit, and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I. Said inspections shall also evaluate compliance with the Best Available Technology requirements of Part I.E.10 of this Permit. The Permittee shall maintain a written record of these inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.

~~13~~¹⁴. LARW and Mixed Waste Evaporation Ponds Monitoring -

a) 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Pond Daily Monitoring - the Permittee shall conduct daily inspections of the 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds to determine compliance with the Best Available Technology requirements of Part I.E.14.a of this Permit, including:

- 1) measurement of pond water level, relative to pond spillway centerline, to determine pond freeboard and,
- 2) determination of operational status of leak detection system pump, pump controller, head/pressure transducer, and flow meter equipment,
- 3) measurement of daily leak detection system flow volume. For BAT compliance monitoring purposes for the 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds, the Permittee shall calculate an average daily leakage volume across a consecutive 6-day period. The Permittee shall perform this calculation for each evaporation pond weekly.
- 4) measurement of daily leak detection system head. For BAT compliance monitoring purposes for the 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds, the Permittee shall determine the maximum head limit to be measured by the approved head/pressure transducer construction that complies with the 1-foot BAT head performance standard of Part I.E.14.a.3. On a daily basis, the Permittee shall compare the daily measured head against the maximum head limit for each evaporation pond.

The Permittee shall maintain written records of the findings of these daily inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.

b) 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Pond Leak Detection System Pump Tests - the Permittee shall conduct a pump test of the evaporation pond's leak detection sump within 5 days of discovery that the

average daily leak detection system flow volume (Part I.F.15.a.3) exceeds the following limits:

- 1) 1995 LARW Evaporation Pond: 155 gallons/day,
- 2) 1997 LARW Evaporation Pond: 160 gallons/day,
- 3) Mixed Waste Evaporation Pond: 160 gallons/day,
- 4) 2000 LARW Evaporation Pond: 355 gallons/day.
Said pump test shall comply with the currently approved BAT Contingency Plan in Appendix K of this Permit.

c) Semi-Annual Monitoring - on a semi-annual basis, the Permittee shall:

- 1) collect water quality samples from fluids stored in the LARW and Mixed Waste Evaporation Ponds,
- 2) analyze said water samples for all groundwater quality protection level parameters defined in Part I.F.5.b.2 Table 1A, above, including a complete gamma spectroscopic analysis,
- 3) measure height of standing water in the ponds upon said sampling, and calculate corresponding pond volumes.

All LARW and Mixed Waste Evaporation Pond sampling shall comply with the currently approved Water Monitoring Quality Assurance Plan in Appendix B of this Permit.

~~14~~¹⁵. Confined Aquifer Head Monitoring - the Permittee shall conduct monthly monitoring of water levels and semi-annual specific gravity measurements in the following wells completed in the deep confined aquifer: I-1-100, I-3-100, GW-19B, and GW-27D. Semi-annual water levels and specific gravity measurements shall be made in conjunction with the semi-annual ground water quality sampling events.

~~15~~¹⁶. Mixed Waste Leachate Monitoring - on a semi-annual basis, the Permittee shall collect representative samples of leachate from the Mixed Waste Cell leachate collection system (upper leachate collection access pipe) and analyze for radiologic contaminants. Said radiologic contaminants shall include:

- 1) all Ground Water Protection Level Parameters found in Tables 1E and 1F of this Permit,
- 2) a complete gamma spectroscopic analysis to determine all other gamma-emitting radioisotopes that may be present.

~~16~~¹⁷. Intermodal Unloading Facility Monitoring - the Permittee shall conduct daily monitoring of the Intermodal Unloading Facility to determine and ensure free

draining conditions exist both on the unloading pad and across the contact stormwater drainage pipeline that discharges to the LARW Evaporation Ponds. The Permittee shall maintain written records of the findings of these daily inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.

~~18. LARW Operations Building Wash Bay Monitoring - the Permittee shall conduct daily monitoring of the wash bay to demonstrate compliance with the Best Available Technology requirements of Part I.E.14.b of this Permit, including:~~

- ~~a) free draining conditions;~~
- ~~b) physical integrity of concrete surfaces, and~~
- ~~c) closed loop conditions or absence of discharge to the ground or groundwater.~~

~~The Permittee shall maintain written records of the findings of these daily inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.~~

17~~19.~~ Box-Washing Facility Monitoring - the Permittee shall conduct daily monitoring of the Box-Washing facility to demonstrate compliance with the Best Available Technology requirements of Part I.E.14.c of this Permit, including:

- a) free draining conditions,
- b) physical integrity of concrete surfaces,
- c) settlement basin water level height,
- d) presence of fluids in the settlement basin leak detection system. Fluid level measurements shall record depth of water level probe insertion from the top of the access pipe, and
- e) absence of discharge to the ground or groundwater.

The Permittee shall maintain written records of the findings of these daily inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.

18 ~~20.~~ Rail Car Wash Facility Monitoring - the Permittee shall conduct daily monitoring of the Track No. 4 and Track No. 2 Rail Car Wash facilities to demonstrate compliance with the Best Available Technology requirements of Part I.E.14.d of this Permit in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.

The Permittee shall maintain written records of the findings of these daily inspections on site. All daily inspection records shall comply with the requirements of Part II.G of this Permit.

19~~21.~~ Railcar Rollover Facility Monitoring – the Permittee shall conduct daily monitoring of the Railcar Rollover Facility to demonstrate compliance with the BAT

Performance and Best Management Practice Standards of Parts I.E.7 and I.E.17 of the Permit in accordance with the currently approved BAT Performance Monitoring Plan and Contingency Plan in Appendices J and K, respectively, of this Permit.

~~20~~²². Open Cell Time Limit Monitoring - the Permittee shall demonstrate compliance with the open cell time limitation requirements of Part I.E.6 of this Permit by observing and recording the following dates of completion for each working area in the LARW Cell:

- a) Initial placement of waste on the first lift on the clay liner,
- b) Completion of construction of the clay radon barrier.

The Permittee shall maintain written records of this monitoring on site. All monitoring records shall comply with the requirements of Part II.G of this Permit.

~~21~~²³. PCB Monitoring - the Permittee shall monitor for PCBs in accordance with the requirements of this Permit, or its appendices, or as requested by the Executive Secretary.

~~22~~²⁴. BAT Performance Monitoring Plan - the Permittee shall demonstrate compliance with the BAT requirements and performance standards and Best Management Practices in Parts I.D and I.E of this Permit by implementing the most current BAT Performance Monitoring Plan approved by the Executive Secretary and provided in Appendix J of this Permit.

~~23~~²⁵. BAT Contingency Plan - in the event that BAT failure occurs at any facility, the Permittee shall implement the most current BAT Contingency Plan approved by the Executive Secretary and provided in Appendix K of this Permit to regain the BAT requirements and performance standards and Best Management Practices specified in Parts I.D and I.E of this Permit.

G. Non-Compliance Status: Ground Water Monitoring and Best Available Technology

1. Noncompliance with the Ground Water Protection Levels - noncompliance with the ground water protection levels in Part I.C, Tables 1A, 1B, 1C, 1D, 1E, and 1F as applied to the compliance monitoring wells defined in Part I.F.1 of this Permit shall be defined as follows:
 - a) Monitoring for Probable Out-of-Compliance Status - monitoring for probable out-of-compliance shall be defined as any one sample in excess of the protection level in Tables 1A, 1B, 1C, 1D, 1E, or 1F of this Permit for any parameter from the same compliance monitoring well.
 - b) Out-of-Compliance Status - out-of-compliance status shall be defined as two (2) consecutive samples in excess of the protection level in Tables 1A, 1B, 1C, 1D, 1E, or 1F of this Permit for any parameter from the same compliance monitoring well.

- c) Other Methods to Determine Ground Water Quality Compliance Status - at the discretion of the Executive Secretary, other methods may be employed to determine the compliance status of the facility with respect to ground water quality data, including:
 - 1) Trend and/or Spatial Analysis - including analysis of any contaminant concentration trend through time in a single compliance monitoring point, and /or spatial analysis of the same from any group of compliance monitoring points.
 - 2) EPA RCRA Statistical Methods - other applicable statistical methods may be used to determine out-of-compliance status, as defined in the EPA document "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities", February 1989, or as amended.
- 2. Requirements for Ground Water Monitoring for Probable Out-of-Compliance Status - the Permittee shall evaluate the results of each round of ground water sampling and analysis to determine existence of monitoring for probable out-of-compliance status as defined in Part I.G.1(a) of this Permit. Upon any determination that probable out-of-compliance status exists, the Permittee shall:
 - a) Notify the Executive Secretary of the probable out-of-compliance (POOC) status within 30 days of the initial detection. In addition, the Permittee shall submit a written report describing all POOC wells and parameters with the associated semi-annual ground water monitoring report, which is due on either March 1 and September 1.
 - b) Immediately implement a schedule of quarterly ground water sampling and analysis for the well(s)/parameter(s) of concern, consistent with the requirements Part I.F.5(b) and the approved Water Monitoring Quality Assurance Plan, Appendix B of this Permit. This quarterly sampling will continue until the compliance status can be determined by the Executive Secretary. Reports of the results of this sampling will be submitted to the Executive Secretary no later than 90 days from the submittal of the associated semi-annual monitoring report, or no later than June 1 or December 1.
- 3. Requirements for Ground Water Out-of-Compliance Status
 - a) Notification and Accelerated Monitoring - the Permittee shall evaluate the results of each round of ground water sampling and analysis to determine existence of out-of-compliance status as defined in Part I.G.1(b) of this Permit. Upon any determination that an out-of-compliance status exists the Permittee shall:
 - 1) Verbally notify the Executive Secretary of the out-of-compliance status within 24 hours, and provide written notice within 5 days of the detection, and

- 2) Immediately implement an accelerated schedule of monthly ground water monitoring of the monitoring wells of concern for the parameters in question. This monitoring shall continue for at least two months or until the facility is brought into compliance, as determined by the Executive Secretary. At the discretion of the Executive Secretary, the Permittee may be required to sample and analyze for additional inorganic, organic, or radiochemical parameters in order to determine the compliance status of the facility. Reports of the results of this sampling will be submitted to the Executive Secretary as soon as they are available, but not later than 45 days from each date of sampling.
 - b) Source and Contamination Assessment Study Plan - within 30 days of the verbal notice to the Executive Secretary required in Part I.G.3(a) of this Permit, the Permittee shall submit an assessment study plan and compliance schedule for:
 - 1) Assessment of the source or cause of the contamination, and determination of steps necessary to correct the source.
 - 2) Assessment of the extent of the ground water contamination and any potential dispersion.
 - 3) Evaluation of potential remedial actions to restore and maintain ground water quality, and ensure that the ground water standards will not be exceeded at the compliance monitoring wells, and best available technology will be re-established.
 - c) Contingency Plan - in the event that Out-of-Compliance status is determined as per Part I.G.1(b) or (c), and upon written notification from the Executive Secretary, the Permittee shall immediately implement the currently approved Contingency Plan in Appendix A of this Permit.
4. Definition and Requirements for Failure to Maintain Best Available Technology -
- a) Definition of Failure to Maintain Best Available Technology (BAT)
Requirements - any violation of the BAT Design Standards in Part I.D, including design, design specifications, or construction requirements shall constitute failure to meet the best available technology requirements of this Permit. Any violation of the BAT Performance Standards in Parts I.D.1 or I.E shall also constitute failure to meet the best available technology requirements of this Permit.
 - b) Requirements for Failure to Maintain Best Available Technology - in the event that the Permittee fails to maintain best available technology in accordance with Parts I.D and I.E, above, the Permittee shall:
 - 1) Notify the Executive Secretary verbally within 24 hours of discovery of the BAT failure, and provide written notice within 5 days of discovery.

- 2) Submit within 5 days of discovery a complete written description of:
 - i) The cause of the BAT failure,
 - ii) Any measures taken by the Permittee to mitigate the BAT failure,
 - iii) Time frame of the discovery of the BAT failure and any mitigation measures were implemented, and
 - iv) Evidence to demonstrate that any discharge or potential discharge caused by the BAT failure did not and will not result in a violation of UAC 19-5-107.
- c) BAT Contingency Plan - in the event that Out-of-Compliance status is determined as per Part I.G.4(a) or by daily implementation of the currently approved BAT Performance Monitoring Plan in Appendix J of this Permit, the Permittee shall immediately implement the currently approved BAT Contingency Plan in Appendix K of this Permit.
5. Affirmative Defense Relevant to Best Available Technology Failures - in the event that a compliance action is initiated against the Permittee for violation of Permit conditions relating to best available technology, the Permittee may affirmatively defend against that action by demonstrating the following:
 - a) The Permittee submitted notification according to UAC R317-6-6.13,
 - b) The failure was not intentional or caused by the Permittee's negligence, either in action or in failure to act,
 - c) The Permittee has taken adequate measures to meet permit conditions in a timely manner or has submitted to the Executive Secretary, for Executive Secretary approval, an adequate plan and schedule for meeting permit conditions, and
 - d) The provisions of UAC 19-5-107 have not been violated.
- H. Reporting Requirements - notwithstanding any other environmental monitoring and reporting required by the Radioactive Materials License, the Permittee shall submit the following reporting information:
 1. Semi-Annual Monitoring - monitoring required in Part I.F of this Permit, shall be reported according to the following schedule, unless modified by the Executive Secretary:

<u>Half</u>	<u>Report Due On</u>
1st (January thru June)	September 1
2nd (July thru December)	March 1

2. Water Level Measurements - the Permittee shall comply with the following groundwater water level reporting requirements:
- a) General Requirements - monthly water level measurements from all ground water monitoring wells will be reported semi-annually in both measured depth to ground water and saline ground water elevations above mean sea level. In addition, semi-annual freshwater equivalent head elevations will be reported for each well and will be derived from semi-annual groundwater specific gravity measurements made in that well during each semi-annual sampling event.
 - b) Maps and Diagrams Format - distribution of freshwater equivalent head will be summarized on a semi-annual basis in the form of:
 - 1) potentiometric maps of the uppermost aquifer for each semi-annual sampling event, and
 - 2) vertical diagrams or cross-sections for each nested well group illustrating water level elevations in both the shallow and confined aquifers (I-1-30 / I-1-100, I-3-30 / I-3-100, GW-19A / GW-19B, and GW-27D).Said potentiometric maps, diagrams, cross-sections, and data will be submitted with the semi-annual monitoring reports required by Part I.H.1.
 - c) Horizontal Hydraulic Gradient Reporting - on a monthly basis the Permittee shall calculate and provide:
 - 1) A site-wide summary of maximum, minimum, and average horizontal hydraulic gradient for all wells located in Section 32 based on saline ground water elevations. Transects for each of the maximum, minimum, and average gradient locations shall be indicated on the monthly equipotential maps required by Part I.H.2.b, and
 - 2) Individual disposal cell summary of maximum, minimum, and average horizontal hydraulic gradient based on saline ground water elevations for the Class A, LARW, 11e.(2), and Mixed Waste disposal facilities. Determination of these individual hydraulic gradients shall be made after division of each disposal cell into smaller sub-areas for purposes of hydraulic gradient comparisons through time, as approved by the Executive Secretary. On an individual cell basis, the Permittee shall indicate those cell sub-areas where the said monthly maximum, minimum, and average hydraulic gradients occurred.

In the event that the horizontal hydraulic gradient of any subarea exceeds the cell-specific Permit limit specified below, the Permittee shall report this exceedance and identify the sub-area in which the exceedance occurred with submission of the semi-annual groundwater monitoring report required by Part I.H.1 of this Permit.

<u>Disposal Cell</u>	<u>Horizontal Hydraulic Gradient Limit</u>
Class A	1.00E-3
LARW	9.67E-4
Mixed Waste	9.67E-4
11e.(2)	3.29E-3

3. Ground Water and Pore Water Quality Sampling - reporting will include:
- a) Field Data Sheets - or copies thereof, including the field measurements, required in Part I.F.5(b)(2) of this Permit, and other pertinent field data, such as:
 - 1) Ground Water Monitoring - well name/number, date and time, names of sampling crew, type of sampling pump or bail, measured casing volume, volume of water purged before sampling, volume of water collected for analysis.
 - 2) Suction Lysimeter/Soil Moisture Monitoring - lysimeter name/number, date and time, names of sampling crew, type of sampling equipment, vacuum applied and duration of application, volume of sample collected, resistivity reading and corresponding moisture content from soil moisture instrumentation.
 - b) Results of Ground Water, Pore Water, and Surface Water Analysis - including date sampled, date received; and the results of analysis for each parameter, including: value or concentration, units of measurement, reporting limit (minimum detection limit for the examination), analytical method, the date of the analysis, counting error for each radiochemical analysis, and total anions and cations for each inorganic analysis.
 - c) Quality Assurance Evaluation - with every sampling report the Permittee shall include a quality assurance evaluation of the reported ground water and pore water data. Said report shall evaluate the sample collection techniques, sample handling and preservation, and analytical methods used in sampling with the objective of verifying the accuracy of the compliance monitoring results.
 - d) Electronic Data Files and Format - in addition to written results required for every sampling report, the Permittee shall provide an electronic copy of all laboratory results for ground water, pore water, and surface water quality sampling. Said electronic files shall consist of a Comma Separated Values (CSV) file format, or as otherwise approved by the Executive Secretary.
4. Spill Reporting - the Permittee shall report as per UAC 19-5-114 ~~and the currently approved LLRW Waste Management Plan (Radioactive Materials License, Condition 59)~~ and for PCB/Radioactive Waste, the Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I, any spill or leakage of waste or waste liquids which comes in contact with native soil or ground water in compliance with Part II.I of this Permit. For spills of solid waste greater

than 100 kg, the spill must be reported to the Division of Radiation Control within 5 business days of discovery.

5. Post-Closure Monitoring - reporting of post-closure monitoring shall comply with the requirements of the approved Post-Closure Monitoring Plan in Appendix F of this Permit.
6. Annual "As-Built" Report - the Permittee shall submit an annual "As-Built" Report to document construction of the LARW and Class A Disposal Cells in compliance with the currently approved design and specifications and Construction Quality Assurance/Quality Control Plan (Radioactive Materials License, Condition 44). The Permittee shall also submit an annual "As-Built" Report to document construction of the 11e.(2) Cells in compliance the currently approved design and specifications and Construction Quality Assurance/Quality Control Plan authorized by Part I.D and Appendix D of this Permit. These reports will be submitted for the Executive Secretary's approval on or before February 1 of each calendar year. This report shall include engineering plans, and cross-sections to document the construction. Said plans shall be based on an elevation survey, conducted and certified by a Utah licensed land surveyor, of all pertinent elements of construction at the facility.

~~7. LARW Container and Bulk Unloading Area Reporting - the Permittee shall report the following events in accordance with the requirements of Part I.H.10 of this Permit:~~

- ~~a. Discovery of fluid or waste leakage from containers on the storage pad;~~
- ~~b. Failure of sump pumps or other equipment at the northeast leachate collection and northwest leak detection systems to provide free and uninterrupted drainage of the storage pad.~~
- ~~c. Exceedance of maximum vehicle, container, or equipment contact pressure defined in Part I.E.10.5 of this Permit.~~

78. Waste Characterization Reporting - in the event that a new contaminant is detected in any waste at the facility, which has not been authorized by Part I.E.1, or if concentrations of approved contaminants are detected above the limits established in Part I.E.2 of this Permit, the Permittee shall notify the Executive Secretary in writing within 5 working days from the date of discovery.

89. Collection Lysimeter Reporting - the Permittee shall provide a verbal report to the Executive Secretary within 24 hours of discovery of the presence of any fluid in the standpipe of the collection lysimeters. The Permittee shall provide a written report of the incident to the Executive Secretary within 5 working days of discovery. The Permittee shall provide a report of the annual video log survey of the lysimeter's drainpipe, as required by Appendix C of this Permit, on or before December 31 of each calendar year.

- ~~9~~10. Reporting of Mechanical Problems or Discharge System Failures - the Permittee shall verbally notify the Executive Secretary within 24 hours of initial discovery of any mechanical or discharge system failure that could affect the chemical characteristics or volume of the discharge. The Permittee shall submit a written report of the failure within 5 days of said failure.
- ~~10~~11. Meteorological Reporting - on or before January 1 of each calendar year, the Permittee shall submit an annual meteorological report for the previous meteorological year (October 1 to September 30) for Executive Secretary approval.
- ~~11~~12. Containerized Waste Storage Area Reporting - the Permittee shall report the following events in accordance with the requirements of Part I.H.10:
- A. Failure of sump pump or other equipment to provide removal of stormwater and free and uninterrupted drainage of the pad, and
 - B. Any container spill or leakage that may have caused a release to the subsurface soils or ground water via cracks or other damage to the asphalt surface.
- ~~12~~13. LARW and Mixed Waste Evaporation Ponds Reporting -
- A. Semi-annual Water Quality Sampling - semi-annual water quality samples collected and analyzed, and pond volume measurements and calculations made in compliance with Part I.F.15 shall be reported in conjunction with the groundwater quality monitoring report required by Part I.H.1 of this Permit.
 - B. 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Pond Daily Monitoring - the Permittee shall report results of daily monitoring for the 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds as follows:
 - 5) BAT Failure Reporting - the Permittee shall report the following monitoring requirements pursuant to Part I.G.4.b:
 - a) Failure to maintain the 24-inch vertical freeboard requirement of Part I.E.14.a.4,
 - b) Failure of operational status for leak detection system pump, pump controller, head/pressure transducer, and/or flow meter equipment, pursuant to Part I.E.14.a.1,
 - c) Daily average leak detection pumpage volumes in excess of the volume monitoring thresholds established in Part I.F.14.b, or the BAT performance standards listed in Part I.E.14.a.2,
 - d) Daily leak detection sump head values in excess of the BAT performance standards established pursuant to Part I.E.14.a.3.

- 2) Leak Detection System Pump Test Reporting - within 15 calendar days of completion of any leak detection system pump test required by Part I.F.14.b of this Permit, the Permittee shall submit a written report for Executive Secretary approval to document equipment, methods, and results of said pump test.
- ~~13~~14. Annual Groundwater Usage Report - on or before March 1 of each calendar year the Permittee shall survey and report the location of all groundwater withdrawals within at least a one-mile radius of the facility boundary. The purpose of this report will be to locate all points near the facility where groundwater is pumped or otherwise removed for any consumptive use, including domestic, agricultural, or industrial purposes. This report shall include a survey of water right appropriations found in the area of interest, identify the owners thereof, and disclose the physical location and depths of all such groundwater withdrawals.
- ~~14~~15. 11e.(2) Construction Notification - in coordination with requirements of Part I.E.13, the Permittee shall provide a minimum 48-hour notice and provide opportunity for Executive Secretary to inspect clay liner and radon barrier construction at the 11e.(2) Cell.
- ~~15~~16. Mixed Waste Cell Leachate Reporting - the Permittee shall report the results of Mixed Waste Leachate water quality sampling and analysis required by Part I.F.18 of this Permit with the semi-annual groundwater monitoring reports required by Parts I.H.1 and I.H.3.
- ~~16~~17. Intermodal Unloading Facility Reporting - in the event that free draining conditions cease, either on the unloading pad or in the contact stormwater drainage line, the Permittee shall report such non-compliance to the Executive Secretary in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.
- ~~18. LARW Operations Building Wash Bay Reporting - the Permittee shall report any non-compliance with Best Available Technology performance requirements of Part I.E.14.b of this Permit in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.~~
- ~~17~~19. Box-Washing Facility Reporting - the Permittee shall report any non-compliance with the Best Available Technology performance requirements of Part I.E.14.d of this Permit in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.
- ~~18~~20. Rail Car Wash Facility Reporting - the Permittee shall report any non-compliance with the Best Available Technology performance requirements of Part I.E.14.d of this Permit in accordance with the currently approved BAT Performance Monitoring Plan and BAT Contingency Plan in Appendices J and K, respectively of this Permit.

~~19~~²¹. Railcar Rollover Facility Reporting – the Permittee shall submit the daily inspection results required in Part I.E.7c.2 with each Quarterly BAT Monitoring Report. The annual inspection and repair activities required under Part I.E.17 shall be submitted with the First Quarterly BAT Monitoring Report of each calendar year. The annual inspection report shall document all inspection and repair activities including photographs of the condition of the surfaces both before and after repairs.

~~20~~²². BAT Quarterly Monitoring Report - the Permittee shall submit a quarterly BAT monitoring report to document compliance with the BAT performance standards mandated by Part I.E of this Permit. The report shall provide results, calculations, and evaluations of daily BAT monitoring data required in Part I.F of this Permit, as follows:

~~a) LARW Container and Bulk Unloading Area – the BAT quarterly monitoring report shall include daily leakage volume monitoring from the northwest leak detection manhole, the number of times fluid was sampled during the quarter, laboratory analytical results of all samples, an interpretation of analytical results, and the results of any investigations conducted to determine the source of fluid.~~

~~a~~^b) 1995 LARW, 1997 LARW, 2000 LARW, and Mixed Waste Evaporation Ponds - the BAT quarterly monitoring report shall:

1. Include a quality assurance evaluation of all daily leak detection system flow volume and head data collected,
2. Include results of daily flow and head monitoring of the leak detection sump at each pond,
3. Include results of weekly calculation of daily average flow volumes from the leak detection sump at each pond, pursuant to Part I.F.14.a.3 of this Permit,
4. Evaluate any apparent trends in daily flow and head monitoring with respect to the pond's ability to comply with the BAT performance standards mandated by Part I.E.14 of this Permit.

~~b~~^e) Reporting Schedule - the BAT Quarterly Monitoring Report shall be submitted for Executive Secretary approval in accordance with the following schedule:

<u>Quarter</u>	<u>Report Due On</u>
1 st (January, February, March)	May 1
2 nd (April, May, June)	August 1
3 rd (July, August, September)	November 1
4 th (October, November, December)	February 1

~~21~~²³. PCB Reporting - the Permittee shall submit to the Executive Secretary the following:

- a) reports as required in The Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), Appendix I,

b) routine reports in accordance with the Permittee's Radioactive Materials License,

c) non-compliance reporting as required by this Permit.

~~22~~²⁴. Comprehensive Ground Water Quality Evaluation Report - 180 days prior to Permit expiration, the Permittee shall submit for Executive Secretary approval a comprehensive ground water quality evaluation report for the site. In submittal of this report, the Permittee shall present a complete and thorough evaluation of all ground water and vadose zone water quality data available for the LARW, 11e.(2), and Mixed Waste facilities. Said report shall be similar to the October 18, 1999 Comprehensive Ground Water Quality Evaluation Report and shall include but not be limited to:

- a) graphs of temporal concentration trends for all compliance monitoring parameters and wells across the entire period of record, and an evaluation of parameter temporal relationships,
- b) number of water quality data available for each compliance parameter for each well,
- c) statistical tests of normality for each compliance parameter water quality data population, including univariate tests or equivalent,
- d) calculation of mean concentration and standard deviation on direct concentration values; for water quality parameter populations that fail the normality test, provide mean concentrations and standard deviations on transformed values that are normally distributed,
- e) calculation of mean concentration plus the second standard deviation for comparison with existing ground water protection levels to identify parameters that warrant an evaluation for ground water protection level adjustments based on natural variations in background concentrations, and
- f) isoconcentration maps of spatial concentration trends across Section 32 and an evaluation of facies and spatial relationships of water quality parameters that warrant an evaluation for ground water protection level adjustments based on section e) above.

~~23~~²⁵. Updated Specific Gravity Report - 180 days prior to Permit expiration, the Permittee shall submit for Executive Secretary approval an updated evaluation and reinterpretation of specific gravity and its effect on ground water elevations and hydraulic gradients using all available data including new or additional data acquired since the last report dated January 12, 2000. This evaluation shall include but not be limited to a comparison of equipotential maps of saline ground water elevations against equipotential maps of fresh water equivalent head; a statistical comparison of well-to-well hydraulic gradients from saline ground water elevations versus well-to-

well hydraulic gradients from fresh water equivalent head; and a sensitivity analysis to evaluate how specific gravity variations affect ground water elevations and the hydraulic gradient across the site.

~~24~~²⁶ Revised Hydrogeologic Report - 180 days prior to Permit expiration, the Permittee shall submit for Executive Secretary approval a revised hydrogeologic report for the disposal facility and surrounding area. In submittal of this report the Permittee shall provide a comprehensive and thorough description of hydrogeologic conditions at the facility current through the time of report submittal. This report will include an updated evaluation and reinterpretation of the site hydrogeology using all available data including new or additional data acquired since Executive Secretary approval of the last revised hydrogeologic report dated January 20, 2000.

I. Compliance Schedule

1. As-Built Report: Suction Lysimeters and Soil Moisture Instruments for LARW Cell - the Permittee shall secure Executive Secretary approval of the November 4, 1993 As-Built report for suction lysimeters and soil moisture instrumentation, entitled: "As-Built for Suction Lysimeters and Soil Resistivity Instruments". After Executive Secretary approval of this document, it shall become an enforceable appendix to this Permit.

~~2. LARW Container and Bulk Unloading Area Engineering Analysis Report - on or before December 1, 1998 the Permittee shall submit an engineering analysis report for Executive Secretary approval. Said report shall determine the maximum working surface traffic wheel load and maximum static load pressure limits needed to prevent liner damage or adverse drainage and percolation performance of the existing LARW Container and Bulk Unloading Area. After Executive Secretary approval, these maximum contact pressures shall become enforceable under Part I.E.10.b.5 of this Permit.~~

~~2~~³ Groundwater Institutional Control Plan - on or before September 1, 1999 the Permittee shall submit a groundwater institutional control plan for Executive Secretary approval. In submittal of this plan the Permittee shall eliminate future inadvertent intrusion into potentially contaminated groundwater at the disposal facilities and subsequent routes of exposure to the public and the environment. Said plan shall include at least one of the options listed in the July 27, 1998 Utah Division of Radiation Control Request for Information.

~~4. Background Groundwater Quality Report for New Compliance Monitoring Wells - the Permittee shall submit for Executive Secretary approval background groundwater quality reports for the following new compliance monitoring wells:~~

~~A. Fluoride Accelerated Quarterly Background Sampling for New Class A Cell compliance monitoring wells GW-81, GW-82, GW-83, GW-84, GW-85, GW-86, GW-88, GW-89, GW-90, GW-91, GW-92, GW-93, GW-94, GW-95, GW-~~

~~99, GW-100, GW-101, and GW-102 in accordance with the May 4, 2001 letter from the Executive Secretary to the Permittee; and~~

~~B. 11e.(2) Parameters Background Sampling for replacement well GW-38R.~~

~~Each report will include but not be limited to:~~

- ~~1) graphs of temporal concentration trends in each well for each monitoring constituent across the period of accelerated monitoring with an evaluation of seasonal and analytical variations;~~
- ~~2) calculation of mean concentration and standard deviation for each constituent in each well; and~~
- ~~3) calculation of mean concentration plus two (2) standard deviations for each constituent in each well.~~

~~— After review and approval of this report, the Executive Secretary may re-open this Permit to establish ground water protection levels for the said wells. Compliance monitoring for these wells/parameters will not commence until the Executive Secretary has incorporated approved ground water protection levels into the Permit.~~

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

- A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity. Failure by the Permittee to conduct all ground water and pore water sampling in compliance with the Ground Water Monitoring Quality Assurance/Quality Control Plan in Appendix B of this Permit shall be considered a failure to monitor and may subject the Permittee to enforcement action.
- B. Analytical Procedures. Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3(L), unless other test procedures have been specified in this Permit. All sample analysis shall be performed by laboratories certified by the State Health Laboratory, or otherwise after prior written approval by the Executive Secretary.
- C. Penalties for Tampering. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this Permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. Reporting of Monitoring Results. Monitoring results obtained during each reporting period specified in the Permit, shall be submitted to the Executive Secretary, Utah Division of Water Quality at the following address no later than the 15th day of the month following the completed reporting period:

Utah Department of Environmental Quality
Division of Water Quality
P.O. Box 144870
Salt Lake City, Utah 84114-4870
Attention: Ground Water Quality Program

- E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this Permit shall be submitted no later than 14 days following each schedule date.
- F. Additional Monitoring by the Permittee. If the Permittee monitors any pollutant more frequently than required by this Permit, using approved test procedures as specified in this Permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.
- G. Records Contents. Records of monitoring information shall include:
1. The date, exact place, and time of sampling or measurements;
 2. The individual(s) who performed the sampling or measurements;

3. The date(s) and time(s) analyses were performed;
 4. The individual(s) who performed the analyses;
 5. The analytical techniques or methods used; and,
 6. The results of such analyses.
- H. Retention of Records. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time.
- I. Twenty-four Hour Notice of Noncompliance Reporting.
1. The Permittee shall verbally report any noncompliance which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the Permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 536-4123, or to the Division of Water Quality, Ground Water Protection Section at (801) 538-6146, during normal business hours (8:00 am - 5:00 pm Mountain Time).
 2. A written submission shall also be provided to the Executive Secretary within five days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 3. Reports shall be submitted to the addresses in Part II.D, Reporting of Monitoring Results.
- J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part II.D are submitted.
- K. Inspection and Entry. The Permittee shall allow the Executive Secretary or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the Permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and,
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.
- L. Monitoring Well "As-Built" Reports - in the event that additional ground water monitoring wells are required by the Executive Secretary, diagrams and description describing the final completion of the monitoring wells shall be submitted within 30 days of construction of each well. These reports will include:
1. Casing: depth, diameter, type of material, type of joints
 2. Screen: length, depth interval, diameter, material type, slot size
 3. Sand Pack: depth interval, material type and grain size
 4. Annular Seals: depth interval, material type
 5. Surface Casing(s) and Cap: depth, diameter, material type
 6. Survey Coordinates and Elevation: ground surface and elevation of water level measuring point in feet above mean sea level, measured to 0.01 of a foot. Said coordinates and elevation shall be conducted and certified by a Utah Licensed Land Surveyor.
 7. Results of slug tests to determine local aquifer permeability in the vicinity of the well. Said tests shall conform with ASTM Method 4044-91. Test results and data analysis thereof shall be submitted for Executive Secretary approval.
- M. Plugging and Abandonment Reports - within 30 days of completion of plugging and abandonment of any environmental measurement system or instrument, including but not limited to ground water monitoring wells, piezometers, soil tensiometers or moisture instrumentation, or any other stationary device to make environmental measurements, the Permittee shall submit an "As-Plugged" report for Executive Secretary approval. Failure to comply with any condition of said approval shall constitute a violation of this Permit.

III. COMPLIANCE RESPONSIBILITIES

- A. Duty to Comply. The Permittee must comply with all conditions of this Permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The Permittee shall give advance notice to the Executive Secretary of the Water Quality Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this Permit shall be construed to relieve the Permittee of the civil or criminal penalties for noncompliance.
- C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.
- D. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Failure to maintain all treatment and control systems in fully functional operating order or condition at the facility is a violation of this Permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the Permit.

IV. GENERAL REQUIREMENTS

- A. Prior Approval. Pursuant to UAC R317-6-6.1.A, the Permittee may not construct, install, or operate waste or wastewater storage, treatment, or disposal facilities, or any other facility that discharges or may discharge pollutants that may move directly or indirectly into groundwater without a ground water discharge permit from the Executive Secretary. Pursuant to UAC R317-6-6.3.J, the Permittee shall submit engineering plans, specifications, and plans for operation and maintenance of a proposed facility prior to Executive Secretary approval.
- B. Planned Changes. The Permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.
- C. Modification of Approved Engineering Design, Specifications, or Construction. Any modification to the approved engineering design, specifications, or construction of the facility cited in this Permit shall require prior Executive Secretary approval. Said facilities shall include, but are not limited to:
1. Waste and Wastewater Disposal and Containment Facilities - including all related engineering containment such as liner, cover, and drainage systems,
 2. Waste and Wastewater Handling and Storage Facilities - used to handle, manage or store wastes prior to permanent disposal,
 3. Decontamination Facilities - used to decontaminate equipment used in the transportation or disposal of waste,
 4. Environmental Monitoring Systems and Equipment - including ground water monitoring wells, piezometers, meteorological monitoring equipment, soil moisture and lysimeter instrumentation, or any other permanent system, mechanism, or instrument to make environmental measurements required by this Permit.
- D. Anticipated Noncompliance. The Permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- E. Permit Actions. This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- F. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this Permit.

- G. Duty to Provide Information. The Permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this Permit.
- H. Other Information. When the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.
- I. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.
1. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer;
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
 2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
 - b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
 3. Changes to Authorization. If an authorization under Part IV.I.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV.I.2 must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.
 4. Certification. Any person signing a document under this section shall make the following certification: "I certify under penalty of law that this document and all

attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- J. Penalties for Falsification of Reports. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- K. Availability of Reports. Except for data determined to be confidential by the Permittee, all reports prepared in accordance with the terms of this Permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.
- L. Property Rights. The issuance of this Permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- M. Severability. The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit, shall not be affected thereby.
- N. Transfers. This Permit may be automatically transferred to a new Permittee if:
1. The current Permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new Permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 3. The Executive Secretary does not notify the existing Permittee and the proposed new Permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.
- O. State Laws. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, penalties

established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.

- P. Reopener Provision. This Permit may be reopened and modified, following proper administrative procedures, to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. If new ground water standards are adopted by the Board, the Permit may be reopened and modified to extend the terms of the Permit or to include pollutants covered by new standards. The Permittee may apply for a variance under the conditions outlined in R317-6.4(D)
 2. Changes have been determined in background ground water quality.
 3. Determination by the Executive Secretary that changes are necessary in either the Permit or the facility to protect human health or the environment.

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LIST OF APPENDICES

- APPENDIX A: Contingency Plan for Exceedences of Ground Water Protection Levels, approved September 24, 1991, retitled June 30, 1999
- APPENDIX B: Water Monitoring Quality Assurance Plan, approved December 5, 1991, latest revision August 2, 2002
- APPENDIX C: Specifications (approved 9/22/92 and 10/21/92) Operation, Maintenance, and Closure Plan for Collection Lysimeters and Related Approvals
- APPENDIX D: Construction QA/QC Plan for 11e.(2) Facility, dated January 21, 1994, latest revision August 9, 2002
- APPENDIX E: Procedure For Certification of 11e.(2) Material, revised March, 1994
- APPENDIX F: Post-Closure Monitoring Plan, approved September 13, 1994, revised January 18, 2000
- APPENDIX G: Weather Station Monitoring Plan, dated September 14, 1994, revised July 12, 2002
- APPENDIX H: RESERVED
- APPENDIX I: Plan for the Management of Waste Containing Polychlorinated Biphenyls (PCBs), approved October 20, 1999, latest revision June 18, 2002
- APPENDIX J: Best Available Technology (BAT) Performance Monitoring Plan, approved October 15, 1999, latest revision May 15, 2002
- APPENDIX K: Best Available Technology (BAT) Contingency Plan, approved October 15, 1999, latest revision May 15, 2002

APPENDIX A

CONTINGENCY PLAN

FOR

EXCEEDENCES OF GROUND WATER PROTECTION LEVELS

SUBMITTED: August 5, 1991

APPROVED: September 24, 1991

RETITLED: June 30, 1999

Permit No. UGW450005

APPENDIX B

WATER MONITORING QUALITY ASSURANCE PLAN

APPROVED: December 5, 1991

LATEST REVISION: August 2, 2002

APPENDIX C

SPECIFICATIONS

AND

OPERATION, MAINTENANCE, AND CLOSURE PLANS

FOR

COLLECTION LYSIMETERS

AND

RELATED APPROVALS

SUBMITTED: September 16, 1992 and October 21, 1992, respectively

APPROVED: September 21, 1992 and November 27, 1992, respectively

APPENDIX D

CONSTRUCTION QA/QC PLAN

FOR

11e.(2) FACILITY

SUBMITTED: February 16, 1994

APPROVED: March 24, 1994

REVISED: August 9, 2002

APPENDIX E

PROCEDURE

FOR

CERTIFICATION OF 11e.(2) MATERIAL

REVISED: March 1994

APPENDIX F

POST-CLOSURE MONITORING PLAN

FOR

LARW AND 11e.(2) DISPOSAL CELLS

APPROVED: September 13, 1994

REVISED: January 18, 2000

APPENDIX G

WEATHER STATION MONITORING PLAN

APPROVED: September 14, 1994

REVISED: July 12, 2002

APPENDIX H

RESERVED

APPENDIX I

PLAN FOR THE MANAGEMENT OF WASTE CONTAINING POLYCHLORINATED BIPHENYLS (PCBs)

APPROVED: October 20, 1999

LATEST REVISION: June 18, 2002

APPENDIX J

BEST AVAILABLE TECHNOLOGY (BAT) PERFORMANCE MONITORING PLAN

APPROVED: October 15, 1999

LATEST REVISION: May 15, 2002

APPENDIX K

BEST AVAILABLE TECHNOLOGY (BAT)

CONTINGENCY PLAN

APPROVED: October 15, 1999

LATEST REVISION: May 15, 2002